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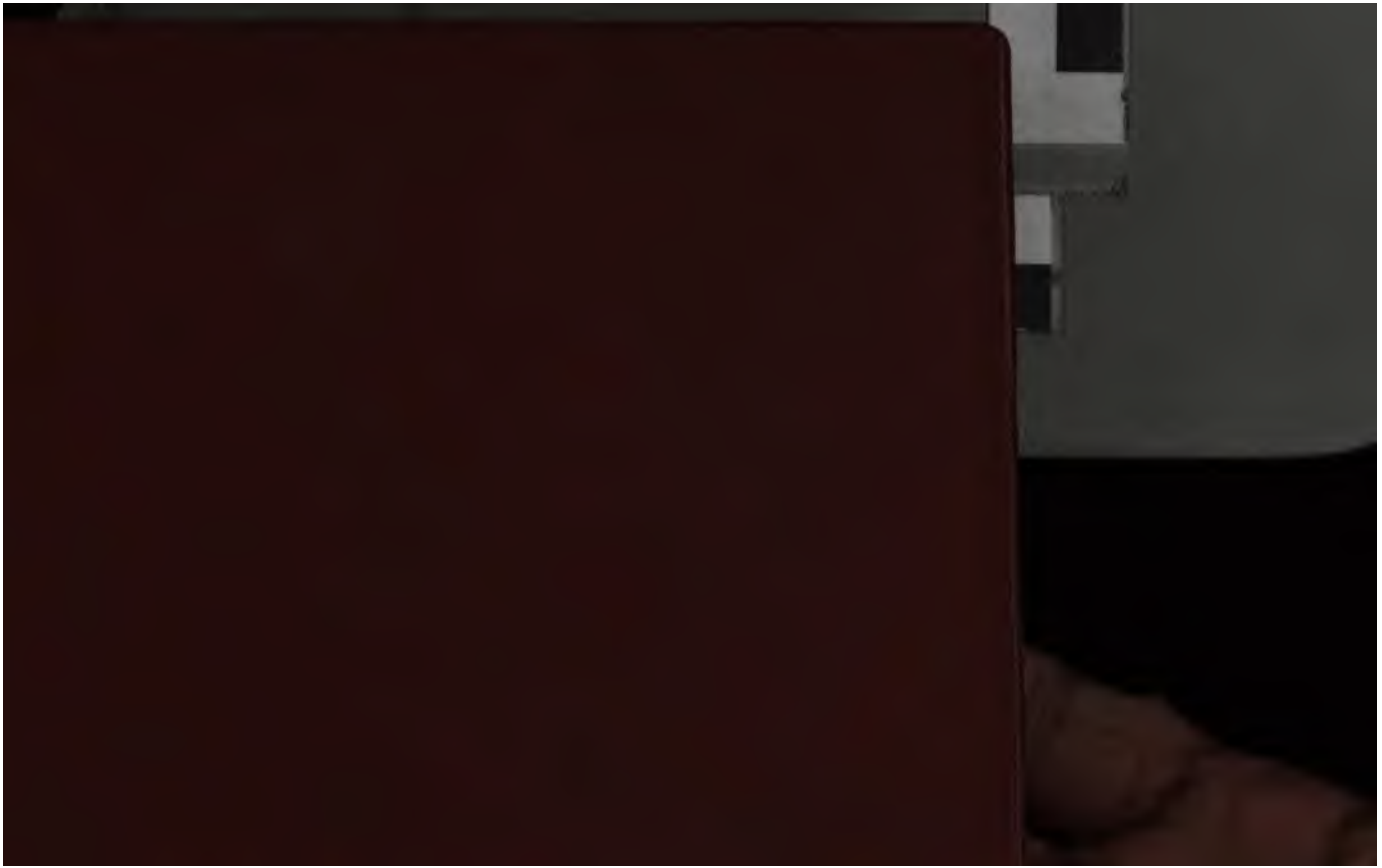

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Bacon

THE

WORKS

OF

FRANCIS BACON,

BARON OF VERULAM, VISCOUNT ST. ALBANS, AND
LORD HIGH CHANCELLOR OF ENGLAND.

Collected and Edited

BY

JAMES SPEDDING, M. A.
OF TRINITY COLLEGE, CAMBRIDGE;

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BARRISTER-AT-LAW; LATE FELLOW OF TRINITY COLLEGE, CAMBRIDGE.

VOLUME IX.

BEING

TRANSLATIONS OF THE PHILOSOPHICAL WORKS,
VOL. II.

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PUBLISHED BY TAGGARD AND THOMPSON.
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PREFACE.*

THE history of these translations has been already told; but as it is somewhat complicated, and appears in some points not to be clearly understood, it may be convenient that I should repeat it here.

The works to be translated were selected by Mr. Ellis, and were meant to include everything which is requisite to give an English reader a complete view of Bacon's philosophy. The selection does, in fact, include all the Latin works belonging to the first and second parts, and as many of those belonging to the third as are not to be found in a more perfect form in the others. And though the Editors' prefaces and notes are not reprinted along

* [This preface, prepared for volume five of the English edition, which begins with the translation of the seventh book of the *De Augmentis Scientiarum*, is placed here in order not to interrupt the continuity of that work. For "the three former volumes," and "the first three volumes," read the seven former volumes, and the first seven volumes; for "preface to the fourth volume" read preface to the eighth volume; for "the first 320 pages of this volume," and "from the beginning to the three hundred and twentieth page of this volume," read from p. 191 of this volume to p. 155 of the next. "The third volume" of the English edition corresponds to volumes five (from p. 185), six, and seven of this edition.]

with them, yet the several pieces being set out in the same order, and bearing the Latin titles on the top of each leaf, it will be easy to find them by reference to the corresponding titles in the three former volumes. So that those who cannot read the Great Instauration in the original may nevertheless have the full benefit of all the explanatory and illustrative matter contained in this edition.

Of the style of translation which has been attempted, I have spoken in my preface to the fourth volume. And though the authorship is of a more mixed character than I could have wished, I hope it will not be found that the number of the workmen has materially impaired the substantial value of the work.

The translation of the *Novum Organum* was finished many years ago. The manuscript, having been carefully examined and much corrected, first by myself, and afterwards by Mr. Ellis, remained in my hands pending the completion of the first three volumes; and was ultimately, for reasons with which it is not necessary to trouble the reader, committed entirely to my charge. In carrying it through the press, I felt myself at liberty to make whatever alterations I pleased; and therefore, if any errors remain, I must consider myself answerable for them.

The task of translating the remainder was entrusted to Mr. Francis Headlam, of University

College, Oxford; and I hoped that my part in it would be no more than that of a critic: I was to revise his manuscript, find faults, and suggest improvements, leaving him to deal with my suggestions upon his own responsibility, according to his own judgment. In this manner the first 320 pages of this volume were executed. But the progress of the sheets through the press (which was still engaged with the third volume) was slow; and before it could proceed further, Mr. Headlam was called upon to fulfil an engagement, which detained him on the continent for the rest of the year; upon which he agreed to leave his manuscript with me, to be dealt with as I thought fit. I used my judgment without any restraint; and as I had certainly full opportunity to remove all defects, it is my fault if I have either introduced any that were not there, or left any that were.

It will be understood, therefore, that the translation of the seventh, eighth, and ninth books of the *De Augmentis Scientiarum*, of the *Historia Ventorum*, and the *Historia Vitæ et Mortis* — extending from the beginning to the three hundred and twentieth page of this volume — is all for which the final responsibility rests with Mr. Headlam. With the translation of the *Novum Organum* he had nothing to do; and the alterations which I made in his manuscript of the rest were not seen by him until they were printed.

With regard to the method observed in the translation, I have only to add, on his behalf, that he agrees with what I have said on that subject in my preface to the fourth volume — that in translating the De Augmentis, his object has been to adopt, as far as he could, the style employed in the Advancement of Learning, — retaining also the original English, wherever no further meaning seemed to be expressed in the Latin; — and that where the form of expression in the translation appears to vary from the Latin more widely than would otherwise be requisite or justifiable, it will generally be found that it is the form used by Bacon himself in the corresponding passage of the English work.

J. S.

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BOOK IV.

CHAPTER I.

Division of the doctrine concerning Man into Philosophy of Humanity *and* Philosophy Civil. *Division of the Philosophy of Humanity into doctrine concerning the* Body of Man *and doctrine concerning the* Soul of Man. *Constitution of one general doctrine concerning the* Nature *or the* State of Man. *Division of the doctrine concerning the State of Man into doctrine concerning the* Person of Man, *and doctrine concerning the* League of Mind and Body. *Division of the doctrine concerning the Person of Man into doctrine concerning the* Miseries of Man, *and doctrine concerning his* Prerogatives. *Division of the doctrine concerning the League into doctrine concerning* Indications *and concerning* Impressions. *Assignation of* Physiognomy *and* Interpretation of Natural Dreams *to the doctrine concerning Indications.*

If any one should aim a blow at me (excellent King) for anything I have said or shall hereafter say in this matter, (besides that I am within the protection of your Majesty,) let me tell him that he is acting contrary to the rules and practice of warfare. For I

am but a trumpeter, not a combatant; one perhaps of those of whom Homer speaks,

Χαίρετε κήρυκες, Διὸς ἄγγελοι, ἠδὲ καὶ ἀνδρῶν:[1]

and such men might go to and fro everywhere unhurt, between the fiercest and bitterest enemies. Nor is mine a trumpet which summons and excites men to cut each other to pieces with mutual contradictions, or to quarrel and fight with one another; but rather to make peace between themselves, and turning with united forces against the Nature of Things, to storm and occupy her castles and strongholds, and extend the bounds of human empire, as far as God Almighty in his goodness may permit.

Let us now come to that knowledge whereunto the ancient oracle directs us, which is the knowledge of ourselves; which deserves the more accurate handling in proportion as it touches us more nearly. This knowledge is for man the end and term of knowledges; but of nature herself it is but a portion. And generally let this be a rule; that all divisions of knowledges be accepted and used rather for lines to mark or distinguish, than sections to divide and separate them; in order that solution of continuity in sciences may always be avoided. For the contrary hereof has made particular sciences to become barren, shallow, and erroneous; not being nourished and maintained and kept right by the common fountain and aliment. So we see Cicero the orator complaining of Socrates and his school, that he was the first who separated philosophy and rhetoric; whereupon rhetoric became an empty and verbal art.[2] So we may see that the opinion of

[1] Hom. Il. i. 334.: — Hail, heralds, messengers of Jove and men!

[2] Cicero De Orat. iii. c. 19.

Copernicus touching the rotation of the earth (which has now become prevalent) cannot be refuted by astronomical principles, because it is not repugnant to any of the phenomena; yet the principles of natural philosophy rightly laid down may correct it. Lastly we see that the science of medicine, if it be forsaken by natural philosophy, is not much better than an empirical practice. With this reservation therefore let us proceed to the doctrine concerning Man. It has two parts. For it considers man either segregate, or congregate and in society. The one I call the Philosophy of Humanity, the other Civil Philosophy. Philosophy of Humanity consists of parts similar to those of which man consists; that is, of knowledges which respect the body, and of knowledges which respect the mind. But before we pursue the particular distributions let us constitute one general science concerning the Nature and State of Man; a subject which certainly deserves to be emancipated and made a knowledge of itself. It is composed of those things which are common as well to the body as the soul; and may be divided into two parts; the one regarding the nature of man undivided, and the other regarding the bond and connexion between the mind and body; the first whereof I will term the doctrine concerning the Person of Man, the second the doctrine concerning the League. But it is plain that these things, being common and mixed, could not all have been assigned to that first division, of sciences which regard the body and sciences which regard the mind.

The doctrine concerning the Person of Man takes into consideration two subjects principally; the Miseries of the human race, and the Prerogatives or Ex-

cellencies of the same. And for the miseries of humanity, the lamentation of them has been elegantly and copiously set forth by many, both in philosophical and theological writings. And it is an argument at once sweet and wholesome.

But that other subject of the Prerogatives of Man seems to me to deserve a place among the *desiderata*. Pindar in praising Hiero says most elegantly (as is his wont) that he "culled the tops of all virtues."[1] And certainly I think it would contribute much to magnanimity and the honour of humanity, if a collection were made of what the schoolmen call the *ultimities*, and Pindar the *tops or summits*, of human nature, especially from true history; showing what is the ultimate and highest point which human nature has of itself attained in the several gifts of body and mind. What a wonderful thing, for example, is that which is told of Cæsar, — that he could dictate to five secretaries at once. And again those exercitations of the ancient rhetoricians, Protagoras and Gorgias, and of the philosophers, Callisthenes, Posidonius, Carneades, — who could speak elegantly and copiously, extempore, on either side of any subject, — is no small honour to the powers of the human wit. A thing inferior in use, but as a matter of display and ability perhaps still greater, is that which Cicero[2] relates of his master Archias — that he could speak extempore a great number of excellent verses about anything that happened to be going on at the time.[3] That Cyrus or Scipio could call so many thousands of men by name was a great feat of memory. Nor are the triumphs of the moral

[1] Pind. Olymp. i. 20. [2] Cicero, pro Archiâ, c. 8.
[3] Cf. Laert. ix. 59.

virtues less famous than those of the intellectual. What a proof of patience is displayed in the story told of Anaxarchus, who, when questioned under torture, bit out his own tongue (the only hope of information), and spat it into the face of the tyrant.[1] Nor was it a less thing in point of endurance (however inferior in worthiness) which occurred in our own times in the case of the Burgundian who murdered the Prince of Orange: being beaten with rods of iron and torn with red-hot pincers, he uttered not a single groan; nay, when something aloft broke and fell on the head of a bystander, the half-burnt wretch laughed in the midst of his torments, though but a little before he had wept at the cutting off of his curling locks. A wonderful composure and serenity of mind at the point of death has also been displayed by many; as in the case of the centurion related by Tacitus: when bidden by the soldier appointed to execute him to stretch out his neck boldly, "I wish," he replied, "that you may strike as boldly." John Duke of Saxony, when the warrant was brought to him for his execution next day, was playing at chess. Calling a bystander to him, he said with a smile, "See whether I have not the best of the game; for when I am dead he (pointing to his adversary) will boast that he was winning." Our own More, too, Chancellor of England, when the day before he was to die a barber came to him (sent because his hair was long, which it was feared might make him more commiserated with the people) and asked him "whether he would be pleased to be trimmed," refused; and turning to the barber, "The King and I (said he) have a suit for my head, and till

[1] Diogen. Laertius, ix. 59.

the title be cleared I will do no cost upon it." The same More, at the very instant of death, when he had already laid his head on the fatal block, lifted it up a little, and gently drew aside his beard, which was somewhat long, saying, "this at least hath not offended the King." But not to stay too long on the point, my meaning is sufficiently clear; namely, that the miracles of human nature, and its highest powers and virtues both in mind and body, should be collected into a volume, which should serve for a register of the Triumphs of Man. In which work I approve the design of Valerius Maximus and C. Pliny, and wish for their diligence and judgment.

With regard to the doctrine concerning the League or Common Bond between the soul and body, it is distributed into two parts. For as in all leagues and amities there is both mutual intelligence and mutual offices, so the description of this league of soul and body consists in like manner of two parts: namely, how these two (that is the Soul and the Body) disclose the one the other, and how they work the one upon the other; by knowledge or indication, and by impression. The former of these (that is, the description of what knowledge of the mind may be obtained from the habit of the body, or of the body from the accidents of the mind) has begotten two arts; both of prediction; whereof the one is honoured with the inquiry of Aristotle, and the other of Hippocrates. And although they have of later times been polluted with superstitious and fantastical arts, yet being purged and restored to their true state, they have both a solid ground in nature and a profitable use in life. The first is Physiognomy, which discovers the dispositions

of the mind by the lineaments of the body; the second is the Interpretation of Natural Dreams, which discovers the state and disposition of the body by the agitations of the mind. In the former of these I note a deficience. For Aristotle has very ingeniously and diligently handled the structure of the body when at rest, but the structure of the body when in motion (that is the gestures of the body) he has omitted; which nevertheless are equally within the observations of art, and of greater use and advantage. For the lineaments of the body disclose the dispositions and inclinations of the mind in general; but the motions and gestures of the countenance and parts do not only so, but disclose likewise the seasons of access, and the present humour and state of the mind and will. For as your Majesty says most aptly and elegantly, "As the tongue speaketh to the ear so the gesture speaketh to the eye."[1] And well is this known to a number of cunning and astute persons; whose eyes dwell upon the faces and gestures of men, and make their own advantage of it, as being most part of their ability and wisdom. Neither indeed can it be denied, but that it is a wonderful index of simulation in another, and an excellent direction as to the choice of proper times and seasons to address persons; which is no small part of civil wisdom. Nor let any one imagine that a sagacity of this kind may be of use with respect to particular persons, but cannot fall under a general rule; for we all laugh and weep and frown and blush nearly in the same fashion; and so it is (for the most part) in the more subtle motions. But if any one be reminded here of chiromancy, let him know that it is a vain

[1] Basilicon Doron, book iii.

imposture, not worthy to be so much as mentioned in discourses of this nature. With regard to the Interpretation of Natural Dreams, it is a thing that has been laboriously handled by many writers, but it is full of follies. At present I will only observe that it is not grounded upon the most solid foundation of which it admits; which is, that when the same sensation is produced in the sleeper by an internal cause which is usually the effect of some external act, that external act passes into the dream. A like oppression is produced in the stomach by the vapour of indigestion and by an external weight superimposed; and therefore persons who suffer from the nightmare dream of a weight lying on them, with a great array of circumstances. A like pendulous condition of the bowels is produced by the agitation of the waves at sea, and by wind collected round the diaphragm; therefore hypochondriacal persons often dream that they are sailing and tossing on the sea. There are likewise innumerable instances of this kind.

The latter branch of the doctrine of the League (which I have termed Impression) has not yet been collected into an art, but only comes in sometimes dispersedly in the course of other treatises. It has the same relation or antistrophe that the former has. For the consideration is twofold; either how and how far the humours and temperament of the body alter and work upon the mind; or again, how and how far the passions or apprehensions of the mind alter and work upon the body. For the physicians prescribe drugs to heal mental diseases, as in the treatment of phrensy and melancholy; and pretend also to exhibit medicines to exhilarate the mind, to fortify the heart and

thereby confirm the courage, to clarify the wits, to corroborate the memory, and the like. But the diets, and choice of meats and drinks, the ablutions, and other observances of the body, in the sect of the Pythagoreans, in the heresy of the Manicheans, and in the law of Mahomet, exceed all measure. So likewise the ordinances in the ceremonial law interdicting the eating of the blood and fat, and distinguishing between beasts clean and unclean for meat, are many and strict. Nay, the Christian faith itself (although clear and serene from all clouds of ceremony) yet retains the use of fastings, abstinences, and other macerations and humiliations of the body, as things not merely ritual, but also profitable. The root and life of all which prescripts (besides the ceremony and the exercise of obedience) consist in that of which we are speaking, namely the sympathy of the mind with the state and disposition of the body. But if any man of weak judgment conceive that these impressions of the body on the mind either question the immortality of the soul, or derogate from its sovereignty over the body, a slight answer may serve for so slight a doubt. Let him take the case of an infant in the mother's womb, which is affected by that which affects the mother, and yet is in due time delivered and separated from her body; or of monarchs who, though powerful, are sometimes controlled by their servants, and yet without abatement of their majesty royal.

As for the reciprocal part (which is the operation of the mind and its passions upon the body), it also has found a place in medicine. For there is no physician of any skill who does not attend to the accidents of the mind, as a thing most material towards recoveries, and

of the greatest force to further or hinder other remedies. But another question pertinent to this subject has been but sparingly inquired into, and nowise in proportion to its depth and worth; namely how far (setting the affections aside) the very imagination of the mind, or a thought strongly fixed and exalted into a kind of faith, is able to alter the body of the imaginant. For although it has a manifest power to hurt, yet it follows not that it has the same degree of power to help; no more indeed than a man can conclude, that because there are pestilent airs, able suddenly to kill a man in health, therefore there should be sovereign airs, able suddenly to cure a man in sickness. Such an inquiry would surely be of noble use; though it needs (as Socrates says[1]) a *Delian diver;* for it lies deep. Again, among those doctrines concerning the League, or the concordances between the mind and body, there is none more necessary than the inquiry concerning the proper seats and domiciles which the several faculties of the mind occupy in the body and its organs. Which kind of knowledge has not been without its followers; but what has been done in it is in most parts either disputed or slightly inquired; so that more diligence and acuteness is requisite. For the opinion of Plato,[2] who placed the understanding in the brain, as in a castle; animosity (which he unfitly enough called anger, seeing it is more related to swelling and pride) in the heart; and concupiscence and sensuality in the liver; deserves neither to be altogether despised nor to be eagerly received. Neither again is that arrangement of the intellectual faculties (imagination, reason, and memory) according to the respective ventricles of the

[1] Diog. Laert. ii. 22. and ix. 12.

[2] Plato, Timæus, p. 71.

brain, destitute of error. Thus then have I explained the doctrine concerning the nature of man undivided, and likewise the league between the mind and body.

CHAP. II.

Division of the doctrine concerning the Body of Man into Medicine, Cosmetic, Athletic, and Voluptuary. *Division of Medicine into three offices;* viz. the Preservation of Health, the Cure of Diseases, and the Prolongation of Life; *and that the last division concerning the Prolongation of Life ought to be kept separate from the other two.*

THE doctrine that concerns man's body receives the same division as the good of man's body, to which it refers. The good of man's body is of four kinds; Health, Beauty, Strength, and Pleasure. The knowledges therefore are in number the same; Medicine, Cosmetic, Athletic, and Voluptuary, which Tacitus truly calls "educated luxury."[1]

Medicine is a most noble art, and according to the poets has a most illustrious pedigree. For they have represented Apollo as the primary god of medicine, and given him a son Æsculapius, likewise a god, professor of the same; seeing that in nature the sun is the author and source of life, the physician the preserver and as it were the second fountain thereof. But a far greater honour accrues to medicine from the works of our Saviour, who was the physician both of soul and body; and as he made the soul the peculiar object of

[1] Tac. Ann. xvi. 18.

his heavenly doctrine, so he made the body the peculiar object of his miracles. For we nowhere read of any miracle done by him with respect to honours or money (except that one, for giving tribute money to Cæsar), but only with respect to the body of man, for the preservation, support, or healing thereof.

This subject of medicine (namely man's body) is of all other things in nature most susceptible of remedy; but then that remedy is most susceptible of error. For the same subtlety and variety of the subject, as it supplies abundant means of healing, so it involves great facility of failing. And therefore as this art (especially as we now have it) must be reckoned as one of the most conjectural, so the inquiry of it must be accounted one of the most exact and difficult. Not that I share the idle notion of Paracelsus and the alchemists, that there are to be found in man's body certain correspondences and parallels which have respect to all the several species (as stars, planets, minerals) which are extant in the universe; foolishly and stupidly misapplying the ancient emblem (that man was a *microcosm* or epitome of the world) to the support of this fancy of theirs. But yet thus much is true, that (as I was going to say) of all substances which nature has produced man's body is the most multifariously compounded. For we see herbs and plants are nourished by earth and water; beasts for the most part by herbs and fruits; but man by the flesh of those beasts (quadrupeds, birds, and fishes), and also by herbs, grains, fruits, juices and liquors of various kinds; not without manifold commixtures, dressings, and preparations of these several bodies, before they come to be his food and aliment. Add to this, that beasts have a more

simple manner of life, and fewer affections to work upon their bodies, and those much alike in their operation; whereas man in his places of habitation, exercises, passions, sleep and watching, undergoes infinite variations; so that it is true that the body of man, of all other things, is of the most fermented and compounded mass. The soul on the other side is the simplest of substances; as is well expressed,

—— purumque reliquit
Æthereum sensum, atque aurai simplicis ignem.[1]

Whence it is no marvel that the soul so placed enjoys no rest; according to the axiom that the motion of things out of their place is rapid, and in their place calm. But to return. This variable and subtle composition and structure of man's body has made it as a musical instrument of much and exquisite workmanship, which is easily put out of tune. And therefore the poets did well to conjoin music and medicine in Apollo; because the genius of both these arts is almost the same; for the office of the physician is but to know how to stretch and tune this harp of man's body that the harmony may be without all harshness or discord. So then the subject being so inconstant and variable has made the art by consequence more conjectural; and the art being so conjectural has made so much more room not only for error, but also for imposture. For almost all other arts and sciences are judged by their power and functions, and not by the successes and events. The lawyer is judged by the virtue of his pleading and speaking, not by the issue of the cause; the master of the ship is judged by his skill

[1] Virg. Æn. vi. 747.: —

—— pure and unmixed
The ethereal sense is left — mere air and fire.

in steering, and not by the fortune of the voyage. But the physician, and perhaps the politician, have no particular acts whereby they may clearly exhibit their skill and ability; but are honoured or disgraced according to the event; — a most unfair way of judging. For who can know, if a patient die or recover, or if a state be preserved or ruined, whether it be art or accident? And therefore many times the impostor is prized, and the man of virtue censured. Nay, such is the weakness and credulity of men, that they will often prefer a witch or mountebank to a learned physician. And therefore the poets were clear-sighted when they made Circe sister of Æsculapius, and both children of the Sun; as is expressed in the verses, — respecting Æsculapius, that he was the son of Apollo,

> Ille repertorem medicinæ talis et artis
> Fulmine *Phœbigenam* Stygias detrusit ad undas;[1]

and again respecting Circe, that she was the daughter of the Sun,

> Dives inaccessos ubi *Solis filia* lucos
> Urit odoratam nocturna in lumina cedrum.[2]

For in all times, in the opinion of the multitude, witches and old women and impostors have been the rivals in a manner of physicians, and almost contended with them in celebrity for working cures. And what follows? Even this, that physicians say to themselves, as Solomon expresses it upon a higher occasion,[3] "If it befall to me as befalleth to the fool, why should I

[1] Virg. Æn. vii. 772.: —

> *Apollo's son* the healing art who gave
> Jove hurled with thunder to the Stygian wave.

[2] Virg. Æn. vii. 11.: —

> Where *the Sun's daughter* in her deep retreat
> Burns for her evening light the cedar sweet.

[3] Eccles. ii. 15.

labour to be more wise?" And therefore I can the less blame physicians that they commonly attend to some other art or practice, which they fancy more than their own. For you have among them poets, antiquaries, critics, rhetoricians, statesmen, divines; and in every one of these arts more learned than in their own profession. Nor does this happen, in my opinion, because (as a certain declaimer against the sciences objects to the physicians) they have so many sad and disgusting objects to deal with that they must needs withdraw their minds to other things for relief (for "he that is a man should not think anything that is human alien to him");[1] but rather upon the ground we are now on, that they find that mediocrity and excellency in their art make no difference in profit or reputation towards their fortune. For the impatience of disease, the sweetness of life, the flattery of hope, the commendations of friends, make men depend upon physicians with all their defects. But yet if these things be more attentively considered, they tend rather to inculpate physicians than to excuse them. For instead of throwing away hope, they ought to put on more strength. For if any man will awake his observation and look a little about him, he will easily see from obvious and familiar examples what a mastery the subtlety and acuteness of the intellect has over the variety either of matter or of form. Nothing more variable than faces and countenances; yet men can bear in memory the infinite distinctions of them; nay a painter, with a few shells of colours, and the help of his eye, of the force of his imagination, and the steadiness of his hand, can imitate and draw the faces of all

[1] Ter. Heauton. i. 1. 25: — Homo sum; humani nihil a me alienum puto.

men that are, have been, or shall be, if they were only brought before him. Nothing more variable than the human voice, yet we easily distinguish the differences of it in different persons; nay and there are buffoons and pantomimes who will imitate and express to the life as many as they please. Nothing more variable than the differing sounds of words, yet men have found the way to reduce them to a few simple letters. And most true it is that perplexities and incomprehensions in science proceed commonly not from any want of subtlety or capacity in the mind, but from the object being placed too far off. For as the sense when at a distance from the object is full of mistaking, but when brought near enough does not much err, so is it with the understanding. But men are wont to look down upon nature as from a high tower and from a great distance, and to occupy themselves too much with generalities; whereas if they would come down and draw near to particulars and take a closer and more accurate view of things themselves, they would gain a more true and profitable knowledge of them. Wherefore the remedy of this evil is not merely to quicken or strengthen the organ, but also to go nearer to the object. And therefore there is no doubt but if the physicians would for a while set these generalities aside and go forth to meet Nature, they would obtain that of which the poet speaks,

> Et quoniam variant morbi, variabimus artes;
> Mille mali species, mille salutis erunt.[1]

Which they should the rather do, because those very

[1] Ovid. Remed. Amor.: —

> Arts shall as various as diseases be;
> Though sickness take a thousand shapes, yet we
> Will find for each its several remedy.

philosophies which physicians, whether regular practitioners or chemists, rely upon (and medicine not founded on philosophy is a weak thing) are themselves of little worth. Wherefore if generalities, though true, have the fault that they do not well lead the way to action; surely there is greater danger in those generalities which are in themselves false, and instead of leading mislead.

Medicine therefore (as we have seen) is a science which has been hitherto more professed than laboured, and yet more laboured than advanced; the labours spent on it having been rather in a circle, than in progression. For I find in the writers thereon many iterations, but few additions. I will divide it into three parts, which I will term its three offices; the first whereof is the Preservation of Health, the second the Cure of Diseases, and the third the Prolongation of Life. But this last the physicians do not seem to have recognised as the principal part of their art, but to have confounded, ignorantly enough, with the other two. For they imagine that if diseases be repelled before they attack the body, and cured after they have attacked it, prolongation of life necessarily follows. But though there is no doubt of this, yet they have not penetration to see that these two offices pertain only to diseases, and such prolongation of life as is intercepted and cut short by them. But the lengthening of the thread of life itself, and the postponement for a time of that death which gradually steals on by natural dissolution and the decay of age, is a subject which no physician has handled in proportion to its dignity. And let not men make a scruple of it, as if this were a thing belonging to fate and Divine Provi-

dence which I am the first to bring within the office and function of art. For Providence no doubt directs all kinds of death alike, whether from violence or disease or the decay of age; yet it does not on that account exclude the use of preventions and remedies. But art and human industry do not command nature and destiny; they only serve and minister to them. Of this part however I will speak hereafter; having in the meantime premised thus much, lest any one should in ignorance confound this third office of medicine with the two former, as has been done hitherto.

With regard to the office of the preservation of health (the first of the three), many have written thereon, very unskilfully both in other respects and especially in attributing too much (as I think) to the choice of meats and too little to the quantity. Moreover with regard to quantity itself they have argued like moral philosophers, too much praising the mean; whereas both fasting, when made customary, and a generous diet, to which one is used, are better preservatives of health than those mediocrities, which only make nature slothful and unable to bear either excess or want when it is necessary. Nor have the kinds of exercises which have most power to preserve health been by any physician well distinguished and pointed out; although there is scarcely any tendency to disease which may not be prevented by some proper exercise. Thus playing at bowls is good for diseases of the reins, archery for those of the lungs, walking and riding for weakness of the stomach, and the like. But as this part touching the preservation of health has been handled as a whole, it is not my plan to pursue the minor defects.

With regard to the cure of diseases, much labour has been bestowed on this part, but with slight profit. To it belongs the knowledge of the diseases to which the human body is subject; with their causes, symptoms, and remedies. In this second office of medicine there are many deficiencies; a few of which, but those the most glaring, I will propound; thinking it sufficient to enumerate them without any law of order or method.

The first is, the discontinuance of the very useful and accurate diligence of Hippocrates, who used to set down a narrative of the special cases of his patients; relating what was the nature of the disease, what the treatment, and what the issue. Therefore having so notable and proper an example in a man who has been regarded as the father of his art, I shall not need to go abroad for an example from other arts; as from the wisdom of the lawyers, who have ever been careful to report the more important cases and new decisions, for instruction and direction in future cases. This continuance of medicinal history I find deficient; especially as carefully and judiciously digested into one body; which nevertheless I do not understand should be either so copious as to extend to every common case of daily occurrence (for that would be something infinite, and foreign to the purpose), or so reserved as to admit none but wonders and prodigies, as has been done by some. For many things are new in the manner and circumstances which are not new in the kind; and if men will apply themselves to observe, they will find even in things which appear commonplace much that is worthy of observation.

Likewise in anatomical inquiries, those things which

pertain to man's body in general are most diligently observed, even to curiosity and in the minutest particulars; but touching the varieties which are found in different bodies, the diligence of physicians falls short. And therefore I say that Simple Anatomy is handled most lucidly, but that Comparative Anatomy is wanting. For men inquire well of the several parts, and their substances, figures, and collocations; but the diversities of the figure and condition of those parts in different men they observe not. The reason of which omission I judge to be no other than that the former inquiry may be satisfied by the view of one or two anatomies, whereas the latter (being comparative and casual) requires the view and attentive study of many. The first likewise is a subject on which learned men may display their knowledge in lectures and before audiences; but the last is only to be gained by silent and long experience. Meanwhile there is no question but that the figure and structure of the inward parts is but little inferior in variety and lineaments to the outward; and that the hearts or livers or stomachs of men differ as much as their foreheads or noses or ears. And in these very differences of the internal parts are often found the "causes continent" of many diseases; which not being observed by the physicians, they quarrel many times with the humours, which are not in fault, the fault being in the very mechanical frame of the part. In the cure of which diseases it is lost labour to employ medicines alterative (for the part admits not of alteration); but the thing must be corrected, and accommodated or palliated by diets and medicines familiar. To Comparative Anatomy belongs likewise the accurate observation as well of all kinds of hu-

mours, as of the footsteps and impressions of diseases in various dissected bodies. For the humours are commonly passed over in anatomies with disgust as purgaments; whereas it is of the first importance to observe of what sort and how manifold the different kinds of humours are (not relying too much on the common divisions of them) which are sometimes found in the human body; and in what cavities and receptacles each of them is most apt to lodge and nestle, and with what benefit or injury, and the like. So again the footsteps and impressions of diseases and the injuries and devastations they cause in the inward parts, ought in different anatomies to be diligently observed; namely imposthumations, exulcerations, discontinuations, putrefactions, corrosions, consumptions, contractions, extensions, convulsions, loosenings, dislocations, obstructions, repletions, tumours; together with all preternatural substances that are found in the human body (as stones, carnosities, excrescences, worms, and the like); all these, I say, and the like of them ought by that Comparative Anatomy which I have spoken of, and the collation of the several experiences of many physicians, to be carefully searched out and compared. But this variety of accidents is either slightly handled in anatomics or else passed over in silence.

Of that other defect in anatomy (that it has not been practised on live bodies) what need to speak? For it is a thing hateful and inhuman, and has been justly reproved by Celsus. But yet it is no less true (as was anciently noted) that many of the more subtle passages, pores, and pertusions appear not in anatomical dissections, because they are shut and latent in dead bodies, though they be open and manifest in live.

Wherefore that utility may be considered as well as humanity, the anatomy of the living subject is not to be relinquished altogether, nor referred (as it was by Celsus) to the casual practices of surgery; since it may be well discharged by the dissection of beasts alive, which, notwithstanding the dissimilitude of their parts to human, may, with the help of a little judgment, sufficiently satisfy this inquiry.

Again, in their inquiry concerning diseases, they find many which they pronounce incurable, some at their very commencement, and others after a certain period. So that the proscriptions of Sylla and the Triumvirs were as nothing to the proscriptions of physicians, wherein by most iniquitous edicts they give up so many to death; of whom nevertheless numbers escape with less difficulty than they did in the Roman proscriptions. Therefore I will not hesitate to set down among the *desiderata* a work on the cure of diseases which are held incurable; that so some physicians of eminence and magnanimity may be stirred up to take this work (as far as the nature of things permits) upon them; since the pronouncing these diseases incurable gives a legal sanction as it were to neglect and inattention, and exempts ignorance from discredit.

Again, to go a little further; I esteem it likewise to be clearly the office of a physician, not only to restore health, but also to mitigate the pains and torments of diseases; and not only when such mitigation of pain, as of a dangerous symptom, helps and conduces to recovery; but also when, all hope of recovery being gone, it serves only to make a fair and easy passage from life. For it is no small felicity which Augustus Cæsar was wont so earnestly to pray for, that same *Euthanasia;*

which likewise was observed in the death of Antoninus Pius,[1] which was not so much like death as like falling into a deep and pleasant sleep. And it is written of Epicurus, that he procured the same for himself; for after his disease was judged desperate, he drowned his stomach and senses with a large draught and ingurgitation of wine; whereupon the epigram was made,

—— hinc Stygias ebrius hausit aquas.[2]

He drowned in wine the bitterness of the Stygian water. But in our times, the physicians make a kind of scruple and religion to stay with the patient after he is given up; whereas in my judgment, if they would not be wanting to their office, and indeed to humanity, they ought both to acquire the skill and to bestow the attention whereby the dying may pass more easily and quietly out of life. This part I call the inquiry concerning *outward Euthanasia*, or the easy dying of the body (to distinguish it from that Euthanasia which regards the preparation of the soul); and set it down among the desiderata.

Again, in the cures of diseases I generally find this deficience; that the physicians of this age, though they pursue well enough the general intentions of cures, yet the particular receipts which are proper for the cure of particular diseases they either do not well understand or do not scrupulously observe. For physicians have frustrated and destroyed the fruit of tradition and experience by their magistralities, in adding and taking away and making changes in their receipts at their pleasure; and substituting *quid pro quo*, much like the chemists; usurping such command over the medicine,

[1] Sueton. in August. c. 99. [2] Cf. Diog. Laert. x. 16

that the medicine loses all command over the disease. For except it be treacle and mithridate, and perhaps disascordium and the confection of alkermes, and a few other medicines, they tie themselves to scarce any certain receipts severely and religiously. For as to those confections which are for sale in the shops, they are rather in readiness for general intentions than accommodated and specially adapted to particular cures; for they do not specially regard any one disease, but relate generally to purging, opening, comforting, and altering. And this is principally the cause why empirics and old women are more happy many times in their cures than learned physicians, because they are more exact and religious in holding to the composition and confection of tried medicines. Indeed I remember a physician here in England, a famous practitioner, in religion almost a Jew, in reading a kind of Arab, who used to say, "Your physicians in Europe are indeed men of learning; but they do not know the particular cures for diseases." He would also say in jest, not very reverently, "that our physicians are like bishops, who have the power of the keys, to bind and loose, and nothing more." But to speak seriously; I conceive that it would be of great use if some physicians, among the more distinguished both for learning and practice, would compose a work on medicines tried and approved by experiment for the cure of particular diseases. For if it be thought fitter for a learned physician (after taking account of the constitution and age of his patients, the season of the year, their customs, and the like) to apply his medicines according to the occasion, than to abide by any certain prescriptions, the opinion, though plausible, is fallacious, and allows

too little weight to experience, and too much to judgment. For as they were the most useful citizens and of the best composition in the state of Rome, who either being consuls inclined to the people, or being tribunes inclined to the senate; so in the matter we now handle, they are the best physicians, who being great in learning most incline to the traditions of experience, or being distinguished in practice do not reject the methods and generalities of art. As to the qualifying of medicines (if it be ever necessary), it ought rather to be done in the vehicles than in the body of the medicines, wherein nothing should be altered without evident necessity. This part therefore, which treats of authentic and positive medicines, I set down as wanting. But it is a thing that should not be undertaken without keen and severe judgment, and in synod, as it were, of select physicians.

Again, in preparation of medicines I find it strange (especially considering how mineral medicines have been so much lauded and extolled by the chemists, and that such medicines are safer applied outwardly than taken inwardly) that no man has endeavoured to make an imitation by art of natural baths and medicinal fountains; although it is confessed that they receive their virtues from the mineral veins through which they flow; and not only so, but as a manifest proof of the fact, human industry has found the way to discern and distinguish by analysis from what kind of mineral such waters receive tincture; as sulphur, vitriol, steel, or the like. Which natural tincture if it might be reduced to compositions of art, would put it in the power of man to make more kinds of them as occasion demands, and to regulate their temper at discretion. This part there-

fore, concerning the imitation of nature in artificial baths (an undertaking doubtless both easy and profitable), I judge to be deficient.

But lest I grow to be more particular than is agreeable either to my intention or to the nature of this treatise, I will conclude this part with the note of one deficience more, which seems to me of greatest consequence; which is, that the method of treatment in use is too compendious to accomplish anything remarkable or difficult. For in my judgment it would be an opinion more flattering than true, to think any medicine can be so sovereign or so happy as that the simple use of it can work any great cure. It were a strange speech, which spoken once, or even spoken many times, should reclaim a man from a vice to which he is by nature subject. The thing is impossible. It is order, pursuit, sequence, and skilful interchange of application, which is mighty in nature. And these things, although they require greater judgment in prescribing and more constant obedience in observing, yet make up for it abundantly by the magnitude of the effects they produce. Now although a man would think, by the daily attentions which physicians pay to their patients, —their visitations, nursings, and prescriptions, — that they were pursuing the cure diligently and following it up by a certain path; yet let a man look more deeply into the prescripts and ministrations which physicians use, and he shall find the most of them full of vacillation and inconstancy, devices of the moment, without any settled or foreseen course of cure; whereas they ought from the very first, as soon as ever the disease is fully discovered and known, to resolve upon some regular plan of treatment, and not to depart therefrom

without grave reason. And let physicians be assured of this: that there may be (for example) three or four medicines rightly prescribed for the cure of some serious disease, which if taken in proper order and at proper intervals will work the cure; but if taken either singly, or in a different order, or without the interval, will prove most injurious. I do not mean that every scrupulous and superstitious prescript should be taken for the best (no more than every strait way is the way to heaven); the way must be the right way no less than the strait and difficult one. This part then, which I will call the *Physician's Clue*, I set down as deficient. And these are the things I find wanting in that part of medicine which relates to the cure of diseases: only there is one thing still remaining, which is of more consequence than all the rest; — namely, a true and active Natural Philosophy for the science of medicine to be built upon. But that does not belong to the present treatise.

The third part of medicine which I have set down is that which relates to the Prolongation of Life, which is new, and deficient; and the most noble of all. For if such a thing may be discovered, the business of medicine will no longer be confined to humble cures, nor will physicians be honoured only for necessity; but for a gift to men — of earthly gifts perhaps the greatest — of which, next to God, they may become the dispensers and administrators. For although to a Christian making for the Land of Promise the world is but a wilderness, yet even while we travel in the wilderness to have our shoes and garments (that is our bodies, which are as the clothing of the soul) not worn out by the way, must be accounted as a gift of divine grace. Upon

this subject then, seeing it is of such excellence, and that I have set it down as wanting, I will after my manner give both admonitions, and directions, and precepts.

My first admonition is, that of the writers upon this argument there is none who has discovered anything great, not to say anything sound. Aristotle has indeed published a very short commentary upon it, in which there is some acuteness: which he, as usual, will have to be everything. But more modern writers have handled it so idly and superstitiously, that by reason of their vanity the argument itself has come to be reputed vain and senseless.

My second admonition is, that the very intentions of physicians in this matter are worth nothing, and rather serve to draw men's thoughts away from the point than to direct them to it. For they tell us that death consists in the destitution of warmth and moisture; and therefore that the natural warmth should be comforted, and the radical moisture cherished. Just as if this could be done by broths, or lettuces and mallows, or starch, or jujubes, or spices, or generous wines, or even spirits of wine and chemical oils; all of which are rather injurious than beneficial.

My third admonition is, that men should cease from trifling, nor be so credulous as to imagine that so great a work as this of delaying and turning back the course of nature can be effected by a morning draught or by the use of some precious drug; by potable gold, or essence of pearls, or suchlike toys; — but be assured that the prolongation of life is a work of labour and difficulty, and consisting of a great number of remedies, and those aptly connected one with another. For

let no man be so dull as to believe that a thing which has never yet been done can be done now except by means yet unattempted.

My fourth admonition is, that men should rightly observe and distinguish between those things which conduce to a healthy life, and those which conduce to a long life. For there are some things which tend to exhilarate the spirits, strengthen the bodily functions, and keep off diseases, which yet shorten the sum of life, and without sickness hasten on the decay of old age. There are others also which are of service to prolong life and retard decay, which yet cannot be used without danger to health, so that they who use them for the prolongation of life should at the same time provide against such inconveniences as may arise from their use. And so much by way of admonition.

With regard to directions, the idea I have formed of the matter is this. Things are preserved and continued in two ways; either in their own identity, or by repair. In their own identity, as a fly or an ant in amber; a flower or an apple or wood in conservatories of snow; a corpse in balsam. By repair, as in flame, and in things mechanical. Now he that seeks to effect the prolongation of life must use both methods (for separate they have less power); and the human body must be preserved as bodies inanimate, and again as flame, and lastly to a certain degree as things mechanical are preserved. Therefore there are three intentions for the prolongation of life; prevention of waste, goodness of repair, and renewal of that which has begun to grow old. Waste is caused by two depredations; that of the native spirit, and that of the surrounding air. Both of these may be prevented in two

ways; either by making those agents less predatory, or the patients (that is, the juices of the body) less susceptible of being preyed on. The spirit is made less predatory if it be either condensed in substance, as in the use of opiates and preparations of nitre, and in mortifications; or diminished in quantity, as in Pythagorean and monastic diets; or quieted in motion, as in leisure and tranquillity. The surrounding air becomes less predatory, when it is either less heated by the rays of the sun, as in cold climates, caves, mountains, and the columns of anchorites; or kept from the body, as by thick skins, the plumage of birds, and the use of oils and unguents without spices. The juices of the body are made less susceptible of depredation, by being rendered either hard, or roscid and oily: hard, as by rough diet, living in the open air, strong exercises, and some mineral baths; roscid, as by the use of sweet things, abstaining from salts and acids, and most of all by such a composition of drink as has very fine and subtle parts, yet free from all acrimony or acidity. Repair is produced by aliments. Now alimentation is promoted in four ways; by the digestion of the bowels to send out the nourishment, as is done by medicines comforting the principal bowels; by excitation of the external parts to attract the aliment, as by exercises, proper frictions, some proper unctions and baths; by preparation of the aliment itself, so that it may insinuate itself more easily and to a certain extent anticipate digestion, as in the various artificial modes of preparing food, mixing drink, fermenting bread, and combining together the virtues of these three; by comforting the last act of assimilation, as in seasonable sleep, and some external applications.

The renovation of what has begun to grow old takes place in two ways; either by the inteneration of the habit of body itself, as in the use of baths, plasters, and unguents, which act so as to sink in without drawing anything out; or by draining out the old moisture and substituting new, as in seasonable and frequent purgings, lettings of blood, and attenuating diets, which restore the flower of the body. And so much for directions.

As for precepts, though many may be deduced from the directions themselves, I think fit to subjoin three as principal. The first is, that prolongation of life is to be expected rather from periodical diets, than from any familiar regimen of living, or even from the excellence of particular recipes. For things which have sufficient strength to turn back the course of nature are generally so strong, and produce such alterations, that they cannot be compounded with any medicine, much less mixed with common food. It remains therefore, that they be used in series, and regularly, and at set times recurring at certain intervals.

The second is, that prolongation of life is to be expected rather from working on the spirits and from the softening of the parts, than from the modes of alimentation. For there being three things which act upon the human body and frame (not taking external accidents into account), namely the spirits, the parts, and the aliments; the way of prolonging life by the modes of alimentation is tedious and circuitous; whereas the ways by working on the spirits and on the parts are much shorter, and sooner attain the desired end; because the spirits are immediately affected both by vapours and passions, which have strange power upon

them; and the parts by baths, unguents, and plasters, which also make sudden impressions.

The third is, that the softening of the parts from without should be effected by things of kindred substance, things that impress, and things that close up. For things of kindred substance are kindly and readily embraced and taken in by the parts, and perform the proper office of emollients: things that impress not only act as vehicles for the virtue of the emollients, making it sink more easily and deeper, but themselves also expand the parts a little: while things that close up retain and keep in and fix for awhile the virtue of both the others, and restrain perspiration, which is a thing opposed to the softening process, because it lets out the moisture. And so by these three (but rather disposed in order and succeeding each other, than mixed together) is the thing accomplished. At the same time I would have it understood that the intention of the softening is not to nourish the parts from without, but only to make them apter to receive nourishment. For whatever is more dry is less active in assimilating. And so much for the Prolongation of Life, now newly assigned to medicine, as the third part.

We come now to Cosmetic, which has parts civil and parts effeminate. For cleanness and decency of body is rightly esteemed to proceed from a modesty of manners, and from reverence, first of all towards God whose creatures we are; then towards society wherein we live; and then also towards ourselves, whom we ought to reverence not less, but rather more, than others. But that adulterate decoration, which makes use of dyes and pigments, is well worthy of the deficiencies which

always attend it; being neither fine enough to deceive, nor convenient enough for use, nor safe and wholesome enough for health. And I wonder that this depraved custom of painting has been by the penal laws, both ecclesiastical and civil, (which have been very severe against extravagance in apparel and effeminate dressing of the hair) so long overlooked. We read indeed of Jezebel, that she painted her face; but nothing of the kind is said of Esther or Judith.

Let us now proceed to Athletic. This I take in a sense somewhat larger than that in which it is usually understood. For to it I refer everything which conduces to the procuring of any kind of ability of which the human body is capable; whether of agility or of endurance. Agility has two parts, strength and swiftness; endurance has likewise two, patience of natural wants, and fortitude under torments. Of all which we often see remarkable examples, in the practice of tumblers, in the hard living of some savages, in the stupendous strength of maniacs, and in the constancy of some persons under exquisite tortures. And if there be found any other faculty not falling into the former divisions (such as the wonderful power of holding the breath, which is often seen in divers), I mean it to be referred to this art. Now that such things can sometimes be done, is very plain; but the philosophy and inquisition of causes relating to them is almost neglected; the rather, I think, because it is thought that such masteries of nature are only attained either by a peculiar aptness of nature in some men, which cannot be taught, or by continual custom from boyhood, a thing which depends upon authority rather than upon teaching. Which though it be not altogether true, yet of

what avail is it to note defects in matters of this kind? For the Olympic Games are over long since; and besides in such things mediocrity is enough for use, excellency in them serving for the most part only for mercenary ostentation.

Lastly I come to Arts of Pleasure Sensual, which are divided according to the senses themselves. The pleasure of the eyes is chiefly Painting, with a number of other arts (pertaining to magnificence) which respect houses, gardens, vestments, vases, cups, gems, and the like. The pleasure of the ears is Music, with its various apparatus of voices, wind, and strings: water instruments, once regarded as the leaders of this art, are now almost out of use. Of all these arts those which belong to the eye and ear are esteemed the most liberal; for these two senses are the purest; and the sciences thereof are the most learned, as having mathematics like a handmaid in their train. The one also has some reference to memory and demonstrations, the other to morality and the passions of the mind. The pleasures of the other senses, and the arts relating to them, are less esteemed; as being more allied to luxury than magnificence. For unguents, odours, the dainties and pleasures of the table, and most of all the stimulants of lust, need rather laws to repress than arts to teach them. It has been well observed by some that military arts flourish at the birth and rise of states; liberal arts when states are settled and at their height; and voluptuary arts when they are turning to decline and ruin. And I fear that this our age of the world, as being somewhat upon the descent of the wheel, inclines to arts voluptuary. Wherefore let these things pass. With arts volup-

tuary I couple arts jocular; for the deceiving of the senses is one of the pleasures of the senses.

And now having run over the doctrines concerning the body of man (Medicine, Cosmetic, Athletic, and the Art Voluptuary), I give this notice in passing; that whereas so many things come into consideration in the human body, parts, humours, functions, faculties, and accidents; and that (if it were a new matter) it would be fit that there should be a single body of learning touching the human body containing them all (like that doctrine concerning the soul, of which I shall soon come to speak); yet to avoid the too great multiplication of arts, or the transposition (more than need be) of their ancient limits, I receive the doctrine concerning the parts of the human body,—the functions, humours, respiration, sleep, generation, the fœtus and gestation in the womb, growth, puberty, old age, fatness, and the like,—into the body of medicine; not that they properly belong to those three offices, but because the human body is in everything the subject of medicine. But voluntary motion and sense I refer to the doctrine concerning the soul, because in these two the soul plays the principal part. And so much for the philosophy concerning the body of man; which is but the tabernacle of the mind.

CHAP. III.

Division of Human Philosophy relating to the Soul into Doctrine concerning the Breath of Life *and Doctrine concerning the* Sensible or Produced Soul. *Second Division of the same Philosophy into Doctrine concerning the* Substance and Faculties of the Soul, *and Doctrine concerning the* Use and Objects of the Faculties. *Two Appendices of the Doctrine concerning the Faculties of the Soul; Doctrine concerning* Natural Divination *and Doctrine concerning* Fascination. *Distribution of the Faculties of the Sensible Soul into* Motion *and* Sense.

Let us now proceed to the doctrine which concerns the Human Soul, from the treasures whereof all other doctrines are derived. The parts thereof are two; the one treats of the rational soul, which is divine; the other of the irrational, which is common with brutes. I mentioned a little before (in speaking of Forms) the two different emanations of souls, which appear in the first creation thereof; the one springing from the breath of God, the other from the wombs of the elements. For touching the first generation of the rational soul, the Scripture says, "He hath made man of the dust of the earth, and breathed into his nostrils the breath of life;" whereas the generation of the irrational soul, or that of the brutes, was effected by the words, "Let the water bring forth; let the earth bring forth." Now this soul (as it exists in man) is only the instrument of the rational soul, and has its origin like that of the brutes in the dust of the earth. For it is not said that "He made the body of man of the dust of the earth," but that "He made man;" that is the

entire man, excepting only the breath of life. Wherefore the first part of the general doctrine concerning the human soul I will term the doctrine concerning the Breath of Life; the other the doctrine concerning the Sensible or Produced Soul. But yet, as hitherto I handle philosophy only (for I have placed sacred divinity at the end of the work), I would not borrow this division from theology, if it were not consonant with the principles of philosophy also. For there are many and great excellencies of the human soul above the souls of brutes, manifest even to those who philosophise according to the sense. Now wherever the mark of so many and great excellencies is found, there also a specific difference ought to be constituted; and therefore I do not much like the confused and promiscuous manner in which philosophers have handled the functions of the soul; as if the human soul differed from the spirit of brutes in degree rather than in kind; as the sun differs from the stars, or gold from metals.

I must subjoin likewise another division of the general doctrine concerning the human soul before I speak more fully of the species. For that which I shall hereafter say of the species will concern both divisions alike; as well that which I have just set down, as that which I am now about to propose. Let this second division therefore be into the doctrine concerning the Substance and Faculties of the soul, and the doctrine concerning the Use and Objects of the Faculties.

Having therefore laid down these two divisions, let us now proceed to the species. The doctrine concerning the breath of life, as well as the doctrine concerning the substance of the rational soul, includes those inquiries touching its nature, — whether it be native or

adventive, separable or inseparable, mortal or immortal, how far it is tied to the laws of matter, how far exempted from them; and the like. Which questions though even in philosophy they admit of an inquiry both more diligent and more profound than they have hitherto received, yet I hold that in the end all such must be handed over to religion to be determined and defined. Otherwise they will be subject to many errors and illusions of the sense. For since the substance of the soul in its creation was not extracted or produced out of the mass of heaven and earth, but was immediately inspired from God; and since the laws of heaven and earth are the proper subjects of philosophy; how can we expect to obtain from philosophy the knowledge of the substance of the rational soul? It must be drawn from the same divine inspiration, from which that substance first proceeded.

The doctrine concerning the sensible or produced soul, however, is a fit subject of inquiry even as regards its substance; but such inquiry appears to me to be deficient. For of what service are such terms as *ultimate act*, *form of the body*, and such toys of logic, to the doctrine concerning the substance of the soul? For the sensible soul — the soul of brutes — must clearly be regarded as a corporeal substance, attenuated and made invisible by heat; a breath (I say) compounded of the natures of flame and air, having the softness of air to receive impressions, and the vigour of fire to propagate its action; nourished partly by oily and partly by watery substances; clothed with the body, and in perfect animals residing chiefly in the head, running along the nerves, and refreshed and repaired by the spirituous blood of the arteries; as Ber-

nardinus Telesius and his pupil Augustinus Donius have in part not altogether unprofitably maintained. Let there be therefore a more diligent inquiry concerning this doctrine; the rather because the imperfect understanding of this has bred opinions superstitious and corrupt and most injurious to the dignity of the human mind, touching metempsychosis, and the purifications of souls in periods of years, and indeed too near an affinity in all things between the human soul and the souls of brutes. For this soul is in brutes the principal soul, the body of the brute being its instrument; whereas in man it is itself only the instrument of the rational soul, and may be more fitly termed not soul, but spirit. And so much for the substance of the soul.

The faculties of the soul are well known; understanding, reason, imagination, memory, appetite, will; in short all with which the logical and ethical sciences deal. But in the doctrine concerning the soul the origins of these faculties ought to be handled, and that physically, as they are innate and inherent in the soul; the uses only and objects of them being deputed to those other arts. In which part nothing of much value (in my opinion) has as yet been discovered; though I cannot indeed report it as deficient. This part touching the faculties of the mind has likewise two appendices, which themselves also, as they are handled, have rather produced smoke than any clear flame of truth. One of these is the doctrine of Natural Divination, the other of Fascination.

Divination has been anciently and not unfitly divided into two parts; Artificial and Natural. Artificial makes prediction by argument, concluding upon

signs and tokens; Natural forms a presage from an inward presentiment of the mind, without the help of signs. Artificial is of two sorts; one argues from causes; the other only from experiments, by a kind of blind authority. Which latter is for the most part superstitious; such as were the heathen observations upon the inspection of entrails, the flights of birds, and the like. And the more solemn astrology of the Chaldeans was little better. But artificial divination of both kinds is dispersed among different knowledges. The astrologer has his predictions, from the position of the stars. The physician likewise has his predictions of approaching death, of recovery, of coming symptoms of diseases, from the urine, the pulse, the look of the patient, and the like. The politician also has his; "O venal city, that will quickly perish, if it finds a purchaser:"[1] which prediction was not long in being verified; being fulfilled in Sylla first, and afterwards in Cæsar. Predictions of this kind therefore are not to our present purpose, but are to be referred to their own arts. But Natural Divination, which springs from the inward power of the mind, is that which I now speak of. This is of two sorts; the one Primitive, the other by Influxion. Primitive is grounded upon the supposition that the mind, when it is withdrawn and collected into itself, and not diffused into the organs of the body, has of its own essential power some prenotion of things to come. Now this appears most in sleep, in extasies, and near death; and more rarely in waking apprehensions, or when the body is healthy and strong. But this state of mind is commonly induced or furthered by those abstinences and observances

[1] Sallust, in Bell. Jugurth. 38.

which most withdraw the mind from exercising the duties of the body, so that it may enjoy its own nature, free from external restraints. Divination by influxion is grounded upon this other conceit; that the mind, as a mirror or glass, receives a kind of secondary illumination from the foreknowledge of God and spirits; and this also is furthered by the same state and regimen of the body as the other. For the retiring of the mind within itself gives it the fuller benefit of its own nature, and makes it the more susceptible of divine influxions; save that in divinations by influxion the mind is seized with a kind of fervency and impatience as it were of the present Deity (a state which the ancients noted by the name of divine fury); while in primitive divination it is more in a state of quiet and repose.

Fascination is the power and act of imagination intensive upon the body of another (for of the power of imagination upon the body of the imaginant I have spoken above); wherein the school of Paracelsus and the disciples of pretended natural magic have been so intemperate, that they have exalted the power and apprehension of the imagination to be much one with the power of miracle-working faith. Others, that draw nearer to probability, looking with a clearer eye at the secret workings and impressions of things, the irradiations of the senses, the passage of contagion from body to body, the conveyance of magnetic virtues, have concluded that it is much more probable there should be impressions, conveyances, and communications from spirit to spirit (seeing that the spirit is above all other things both strenuous to act and soft and tender to be acted on); whence have arisen those conceits (now

become as it were popular) of the mastering spirit, of men unlucky and ill omened, of the glances of love, envy, and the like. With this is joined the inquiry how to raise and fortify the imagination; for if the imagination fortified have so much power, it is worth while to know how to fortify and exalt it. And here comes in crookedly and dangerously a palliation and defence of a great part of ceremonial magic. For it may be speciously pretended that ceremonies, characters, charms, gesticulations, amulets, and the like, do not derive their power from any tacit or sacramental contract with evil spirits, but serve only to strengthen and exalt the imagination of him who uses them. As likewise in religion the use of images to fix the cogitations and raise the devotions of those who pray before them has grown common. My own judgment however is this: though it be admitted, that imagination has power, and further that ceremonies fortify and strengthen that power; and that they be used sincerely and intentionally for that purpose, and as a physical remedy, without any the least thought of inviting thereby the aid of spirits; they are nevertheless to be held unlawful, as opposing and disputing that divine sentence passed upon man for sin, "In the sweat of thy face shalt thou eat bread."[1] For magic of this kind proposes to attain those noble fruits which God ordained to be bought at the price of labour by a few easy and slothful observances.

There remain two doctrines, which refer principally to the faculties of the inferior or sensible soul, — as that which is most connected with the organs of the body; the one concerning Voluntary Motion, the other

[1] Gen. iii. 19.

concerning Sense and the Sensible. In the first of these, which has in other respects also been very barrenly inquired, one entire part almost is wanting. For the proper office and structure of the nerves and muscles, and of the other parts required for this motion; and what part of the body is at rest, while another moves; and that the imagination is as it were the director and driver of this motion, insomuch that when the image which is the object of the motion is withdrawn the motion itself is immediately interrupted and stopped (as in walking, if you begin to think eagerly and fixedly of something else, you immediately stand still); these, I say, and some other subtleties which are not amiss, have long ago come into observation and inquiry. But how the compressions, dilatations, and agitations of the spirit (which is doubtless the source of motion) can sway, excite, or impel the corporeal and gross mass of the parts, has not as yet been diligently inquired and handled. And no wonder; seeing the sensible soul has been regarded rather as a function than as a substance. But since it is now known that it is itself a corporeal and material substance, it is necessary to inquire by what efforts a spirit so small and tender can put in motion bodies so gross and hard. Of this part therefore, since it is deficient, let inquiry be made.

Concerning Sense and the Sensible there has been much fuller and more diligent inquiry, both in general treatises concerning them and also in particular arts, as perspective and music; how correctly, is nothing to the purpose, seeing they cannot be ranked as deficients. Yet there are two noble and distinguished parts, which I pronounce deficient in this doctrine; the one con-

cerning the Difference of Perception and Sense, the other concerning the Form of Light.

A good explanation of the difference between Perception and Sense should have been prefixed by philosophers to their treatises on Sense and the Sensible, as a matter most fundamental. For we see that all natural bodies have a manifest power of perception, and also a kind of choice in receiving what is agreeable, and avoiding what is hostile and foreign. Nor am I speaking only of the more subtle perceptions, as when the magnet attracts iron, flame leaps towards naphtha, one bubble coming near another unites with it, rays of light start away from a white object, the body of an animal assimilates things that are useful and excerns things that are not so, part of a sponge attracts water (though held too high to touch it) and expels air, and the like. For what need is there of enumerating such things? since no body when placed near another either changes it or is changed by it, unless a reciprocal *perception* precede the operation. A body perceives the passages by which it enters; it perceives the force of another body to which it yields; it perceives the removal of another body which held it fast, when it recovers itself; it perceives the disruption of its continuity, which for a time it resists; in short there is Perception everywhere. And air perceives heat and cold so acutely, that its perception is far more subtle than that of the human touch, which yet is reputed the normal measure of heat and cold. It seems then that in regard to this doctrine men have committed two faults; one, that they have for the most part left it untouched and unhandled (though it be a most noble subject); the other, that they who have happened to

turn their minds to it have gone too far, and attributed *sense* to all bodies; so that it were a kind of impiety to pluck off the branch of a tree, lest it should groan, like Polydorus.[1] But they should have examined the difference between perception and sense, not only in sensible as compared with insensible bodies (as plants with animals), one body with another; but also in the sensible body itself they should have observed what is the reason why so many actions are performed without any sense at all; why food is digested and ejected; humours and juices carried up and down; the heart and the pulse beat; the entrails, like so many workshops, perform every one its own work; and yet all these and many other things are done without sense. But men have not seen clearly enough of what nature the action of sense is; and what kind of body, what length of time, or what repetition of impression is required to produce pleasure or pain. In a word, they do not seem at all to understand the difference between simple perception and sense; nor how far perception may take place without sense. Neither is this a dispute about words merely, but about a matter of great importance. Concerning this doctrine then (being of great use and bearing upon very many things) let a better inquiry be set on foot. For ignorance on this point drove some of the ancient philosophers to suppose that a soul was infused into all bodies without distinction; for they could not conceive how there could be motion at discretion without sense, or sense without a soul.

That no due investigation has been made concerning the Form of Light (especially as men have taken great pains about perspective) may be considered an

[1] Virg. Æn. iii. 39.

astonishing piece of negligence. For neither in perspective nor otherwise has any inquiry been made about Light which is of any value. The radiations of it are handled, not the origins. But it is the placing of perspective among the mathematics that has caused this defect, and others of the kind; for thus a premature departure has been made from Physics. Again the manner in which Light and its causes are handled in Physics is somewhat superstitious, as if it were a thing half way between things divine and things natural; insomuch that some of the Platonists have made it older than matter itself; asserting upon a most vain notion that when space was spread forth it was filled first with light, and afterwards with body; whereas the Holy Scriptures distinctly state that there was a dark mass of heaven and earth before light was created. And where the subject is handled physically and according to sense, it comes at once to questions of radiation; so that there is but little physical inquiry extant on the matter. Now men ought to have sunk their speculations for awhile, and inquired what that is which is common to all lucid bodies; in other words, into the Form of Light. For see what an immense difference of body there is (if they be considered according to their dignity) between the sun and rotten wood, or even the putrified scales of fish? They should also have inquired why some things take fire and throw out light when heated, and others not. Iron, metals, stones, glass, wood, oil, tallow, when they are subjected to fire, either break into flame, or at least become red; but water and air do not acquire any light from the most intense and raging heat, nor cast forth any brightness. And if any one thinks that this

is because it is the property of fire to shine, and air and water are entirely hostile to fire, he can never have rowed on the sea on a dark night in hot weather; when he would have seen the drops of water that are struck up by the oars glittering and shining: a thing which happens likewise in the boiling sea-froth, which they call "sea-lungs." Lastly, what connexion with fire and lighted matter have glowworms and fireflies, and the Indian fly, which lights up a whole room; or the eyes of some animals in the dark; or sugar while it is being scraped or broken; or the sweat of a horse, hard-ridden on a hot night; and the like? Nay, so little is this subject understood, that most people think sparks from flint to be but air in friction. And yet since the air does not take fire with heat, and manifestly conceives light, how happens it that owls and cats and some other animals can see by night? It must needs be (since sight cannot pass without light) that the air has some pure and natural light of its own, which, though very faint and dull, is nevertheless suited to the visual organs of such animals, and enables them to see. But the reason of this error (as of most others) is that men have not from particular instances elicited the Common Forms of natures; which I have laid down as the proper subject of Metaphysic, which is itself a part of Physic, or of the doctrine concerning nature. Wherefore let inquiry be made of the Form and Origins of Light, and in the meantime let it be set down as deficient. And so much for the doctrine concerning the substance of the soul both rational and sensible, with its faculties; and for the appendices of that doctrine.

OF

THE ADVANCEMENT OF LEARNING.

BOOK V.

CHAPTER I.

Division of the Doctrine concerning the Use and Objects of the Faculties of the Human Soul into Logic *and* Ethic. *Division of Logic into the Arts of* Discovering, *of* Judging, *of* Retaining, *and of* Transmitting.

THE doctrine concerning the Intellect (most excellent King), and the doctrine concerning the Will of man, are as it were twins by birth. For purity of illumination and freedom of will began and fell together; and nowhere in the universal nature of things is there so intimate a sympathy as between truth and goodness. The more should learned men be ashamed, if in knowledge they be as the winged angels, but in their desires as crawling serpents; carrying about with them minds like a mirror indeed, but a mirror polluted and false.

I come now to the knowledge which respects the use and objects of the faculties of the human soul. It has two parts, and those well known and by general agreement admitted; namely, Logic and Ethic; only Civil Knowledge, which is commonly ranked as a part

of Ethic, I have already emancipated and erected into an entire doctrine by itself, — the doctrine concerning man congregate, or in society; and in this place I treat only of man segregate. Logic discourses of the Understanding and Reason; Ethic of the Will, Appetite, and Affections: the one produces determinations, the other actions. It is true indeed that the imagination performs the office of an agent or messenger or proctor in both provinces, both the judicial and the ministerial. For sense sends all kinds of images over to imagination for reason to judge of; and reason again when it has made its judgment and selection, sends them over to imagination before the decree be put in execution. For voluntary motion is ever preceded and incited by imagination; so that imagination is as a common instrument to both, — both reason and will; saving that this Janus of imagination has two different faces; for the face towards reason has the print of truth, and the face towards action has the print of goodness; which nevertheless are faces,

—— quales decet esse sororum.[1]

Neither is the imagination simply and only a messenger; but it is either invested with or usurps no small authority in itself, besides the simple duty of the message. For it was well said by Aristotle, "That the mind has over the body that commandment which the lord has over a bondman; but that reason has over the imagination that commandment which a magistrate has over a free citizen,"[2] who may come also to rule in his turn. For we see that in matters of faith and

[1] Ov. Met. ii. 14.: — Such as sisters' faces should be.
[2] Arist. Pol. i. 3.

religion our imagination raises itself above our reason; not that divine illumination resides in the imagination; its seat being rather in the very citadel of the mind and understanding; but that the divine grace uses the motions of the imagination as an instrument of illumination, just as it uses the motions of the will as an instrument of virtue; which is the reason why religion ever sought access to the mind by similitudes, types, parables, visions, dreams. And again it is no small dominion which imagination holds in persuasions that are wrought by eloquence; for when by arts of speech men's minds are soothed, inflamed, and carried hither and thither, it is all done by stimulating the imagination till it becomes ungovernable, and not only sets reason at nought, but offers violence to it, partly by blinding, partly by incensing it. Nevertheless, I see no cause to alter the former division; for imagination hardly produces sciences; poesy (which in the beginning was referred to imagination) being to be accounted rather as a pleasure or play of wit than a science. And for the power of the imagination in nature, I have just now assigned it to the doctrine concerning the soul. And its relation to rhetoric I think best to refer to that art itself, which I shall handle hereafter.

That part of human philosophy which regards Logic is less delightful to the taste and palate of most minds, and seems but a net of subtlety and spinosity. For as it is truly said that "knowledge is the food of the mind," so in their choice and appetite for this food most men are of the taste and stomach of the Israelites in the desert, that would fain have returned to the flesh-pots, and were weary of manna; which though

it were celestial, yet seemed less nutritive and comfortable. And in like manner those sciences are (for the most part) best liked which have some infusion of flesh and blood; such as civil history, morality, policy, about which men's affections, praises, fortunes, turn and are occupied. But this same "dry light" parches and offends most men's soft and watery natures. But to speak truly of things as they are in worth, rational knowledges are the keys of all other arts. And as the hand is the instrument of instruments, and mind is the form of forms, so these are truly said to be the arts of arts. Neither do they only direct, but likewise confirm and strengthen; even as the habit of shooting not only enables one to take a better aim, but also to draw a stronger bow.

The logical arts are four in number; divided according to the ends at which they aim. For men's labour in rational knowledges is either to invent that which is sought, or to judge that which is invented, or to retain that which is judged, or to deliver over that which is retained. So therefore the Rational Arts must be four; Art of Inquiry or Invention; Art of Examination or Judgment; Art of Custody or Memory; and Art of Elocution or Tradition. Of these I will now speak separately.

CHAP. II.

Division of the Art of Discovery into discovery of Arts *and discovery of* Arguments: *and that the former of these (which is the most important) is wanting. Division of the Art of Discovery of Arts into* Learned Experience *and the* New Organon. *Description of* Learned Experience.

INVENTION is of two kinds, very different; the one of arts and sciences, and the other of speech and arguments. The former of these I report altogether deficient, which seems to me to be such a deficience, as if in the making of an inventory touching the estate of a deceased person, it should be set down that "there is no ready money." For as money will fetch all other commodities, so by this art all the rest are obtained. And as the West Indies would never have been discovered if the use of the mariner's needle had not been discovered first, though the one be vast regions and the other a small motion; so it cannot be found strange if no further progress has been made in the discovery and advancement of the arts, when the art itself of discovery and invention has as yet been passed over.

That this part of knowledge is wanting stands plainly confessed. For in the first place, Logic says nothing, no nor takes any thought, about the invention of arts, whether mechanical or what are termed liberal, or about eliciting the works of the one or the axioms of the other; but passes on, merely telling men by the way that for the principles of each art they must con-

sult the professor of it. Celsus, a wise man as well as a physician, (though all men are wont to be large in praise of their own art) acknowledges gravely and ingenuously, speaking of the empirical and dogmatical sects of physicians, that medicines and cures were first found out, and then afterwards the reasons and causes were discovered; and not the causes first found out from the nature of things, and by light from them the medicines and cures discovered. And Plato more than once intimates, "that particulars are infinite; and the higher generalities give no sufficient direction; that the pith therefore of all sciences, which makes the artsman differ from the inexpert, is in the middle propositions, which in every particular knowledge are taken from tradition and experience." Moreover they who have written about the first inventors of things or the origins of sciences have celebrated chance rather than art, and represented brute beasts, quadrupeds, birds, fishes, serpents, as the doctors of sciences, rather than men:

> Dictamnum genitrix Cretæa carpit ab Ida,
> Puberibus caulem foliis, et flore comantem
> Purpureo: non illa feris incognita capris
> Gramina, cum tergo volucres hæsere sagittæ.[1]

So that it is no marvel (the manner of antiquity being to consecrate inventors of useful things) that the ancient Egyptians (to whom very many of the arts owe

[1] Virg. Æn. xii. 412.:—

> Far off in Cretan Ide a plant there grew
> With downy leaves and flower of purple hue,
> The dittany, whose medicinable power
> The wild goat proves whene'er in evil hour
> The hunter's arrow lodges in his side.

their origin) had so few human idols in their temples, but almost all brute;

> Omnigenumque Deum monstra, et latrator Anubis,
> Contra Neptunum, et Venerem, contraque Minervam, &c.[1]

And if you like better, according to the tradition of the Greeks, to ascribe the first inventions to men; yet you would not say that Prometheus was led by speculation to the discovery of fire, or that when he first struck the flint he expected the spark; but rather that he lighted on it by accident, and (as they say) stole it from Jupiter. So that in the invention of arts it would seem that hitherto men are rather beholden to a wild goat for surgery, to a nightingale for music, to the ibis for clysters, to the pot lid that flew open for artillery, and in a word to chance, or anything else, rather than to Logic. Neither is that form of invention much other which is well described by Virgil,

> Ut varias usus meditando extunderet artes
> Paulatim.[2]

For here no other method of invention is proposed than that which the brute beasts are capable of and frequently use; which is an extreme solicitude about some one thing, and perpetual practising of it, such as the necessity of self-preservation imposes on such animals. For so Cicero says very truly, "that practice constantly applied to one thing often does more than

[1] Virg. Æn. viii. 698.:—

> All kinds and shapes of gods, a monstrous host,
> The dog Anubis foremost, stood arrayed
> 'Gainst Neptune, Venus, Pallas, &c.

[2] Virg. Georg. i. 133.:—

> So might long use, with studious thought combined,
> The various arts by slow endeavour find.

either nature or art."[1] And therefore if it be said of men,

—— Labor omnia vincit
Improbus, et duris urgens in rebus egestas;[2]

it is likewise said of brutes,

Quis expedivit psittaco suum Χαῖρε?[3]

Who taught the raven in a drought to throw pebbles into a hollow tree where she espied water, that the water might rise till she could reach it with her beak? Who showed the way to the bees, that sail through such a vast sea of air to fields in flower far removed from their hive, and back again? Who taught the ant to bite the grains of corn that she lays up in her hill, lest they should sprout and so disappoint her hope? And in that line of Virgil, if the word "extundere," which imports the difficulty, and the word "paulatim," which imports the slowness of the thing, be observed, we shall find ourselves where we were, amongst those gods of the Egyptians; for men have hitherto used the faculty of reason but little, and the office of art not at all, for the discovery of inventions.

Secondly, this very thing which I assert is demonstrated (if you observe it carefully) by the form of induction which Logic proposes, as that whereby the principles of sciences may be invented and proved; which form is utterly vicious and incompetent, and so far from perfecting nature, that contrariwise it perverts and distorts her. For he that shall attentively

[1] Cicero, Pro Balbo, c. 20.

[2] Virg. Georg. i. 145.: —

—— Stern labour masters all,
And want in poverty importunate.

[3] Persius, Prolog.: — Who taught the parrot to say how d' ye do?

observe how the mind gathers this excellent dew of knowledge, like to that the poet speaks of,

—— aërei mellis cœlestia dona,[1]

(for the sciences themselves are extracted out of particular instances, partly natural partly artificial, as the flowers of the field and the garden) shall find that the mind does of herself by nature manage and act an induction much better than logicians describe it; for to conclude upon a bare enumeration of particulars (as the logicians do) without instance contradictory, is a vicious conclusion; nor does this kind of induction produce more than a probable conjecture. For who can assure himself, when the particulars which he knows or remembers only appear on one side, that there are not others on the contrary side which appear not? As if Samuel should have rested upon those sons of Jesse who were brought before him in the house, and not sought for David, who was in the field.[2] And this form of induction (to say truth) is so gross and stupid, that it had not been possible for wits so acute and subtle as those that have studied these things to offer it to the world, but that they were hurrying on to their theories and dogmaticals, and were too dainty and lofty to pay due attention to particulars, and especially to dwell any time upon them. For they used examples or particular instances but as serjeants or whifflers to drive back the crowd and make way for their opinions, and never called them into council from the first, for the purpose of legitimate and mature deliberation concerning the truth of things. Certainly it is a thing that may touch a man with a

[1] Virg. Georg. iv. 1.: — The heavenly gift of aërial honey.
[2] 1 Sam. xvi.

religious wonder to see how the footsteps of seducement are the very same in divine and human truth. For as in the perception of divine truth man cannot induce himself to become as a child; so in the study of human truth, for grown-up men to be still reading and conning over the first elements of inductions like boys, is accounted poor and contemptible.

Thirdly, even if it be granted that the principles of sciences may, by the induction which is in use, or by sense and experience, be rightly established; yet it is very certain that the lower axioms cannot (in things natural, which participate of matter) be rightly and safely deduced from them by syllogism. For in the syllogism propositions are reduced to principles through intermediate propositions. Now this form of invention or of probation may be used in popular sciences, such as ethics, politics, laws, and the like; yea, and in divinity also, because it has pleased God of his goodness to accommodate himself to the capacity of man; but in Physics, where the point is not to master an adversary in argument, but to command nature in operation, truth slips wholly out of our hands, because the subtlety of nature is so much greater than the subtlety of words; so that, syllogism failing, the aid of induction (I mean the true and reformed induction) is wanted everywhere, as well for the more general principles as for intermediate propositions. For syllogisms consist of propositions, and propositions of words; and words are but the current tokens or marks of popular notions of things; wherefore if these notions (which are the souls of words) be grossly and variably collected out of particulars, the whole structure falls to pieces. And it is not the laborious examination either of conse-

quences of arguments or of the truth of propositions that can ever correct that error; being (as the physicians say) in the first digestion; which is not to be rectified by the subsequent functions. And therefore it was not without great and evident reason that so many philosophers (some of them most eminent) became Sceptics and Academics, and denied any certainty of knowledge or comprehension; affirming that the knowledge of man extended only to appearances and probabilities. It is true that Socrates, when he disclaimed certainty of knowledge for himself, is thought by some to have done it only in irony, and to have enhanced his knowledge by dissembling it; pretending not to know that which it was plain he knew, in order that he might be thought to know also that which he knew not. And in the later academy too (which Cicero embraced) that opinion of the incapacity of the mind to comprehend truth was not held very sincerely. For those who excelled in eloquence commonly chose that sect, for the glory of speaking copiously on either side of the question; whereby they were led astray from the straight road, which they ought to have followed in pursuit of truth, into certain pleasant walks laid out for amusement and recreation. It is certain however that there were some here and there in both academies (both old and new) and much more among the Sceptics, who held this opinion in simplicity and integrity. But their great error was, that they laid the blame upon the perceptions of the sense, and thereby pulled up the sciences by the very roots. Now the senses, though they often deceive us or fail us, may nevertheless, with diligent assistance, suffice for knowledge; and that by the help not so much of

instruments (though these too are of some use) as of those experiments which produce and urge things which are too subtle for the sense to some effect comprehensible by the sense. But they ought rather to have charged the defect upon the mind — as well its contumacy (whereby it refuses to submit itself to the nature of things) as its errors, — and upon false forms of demonstration, and ill-ordered methods of reasoning and concluding upon the perception of the senses. But this I say not to disable the intellect, or to urge the abandonment of the enterprise; but to stir men to provide the intellect with proper helps for overcoming the difficulties and obscurities of nature. For no steadiness of hand or amount of practice will enable a man to draw a straight line or perfect circle by hand alone, which is easily done by help of a ruler or compass. And this is the very thing which I am preparing and labouring at with all my might, — to make the mind of man by help of art a match for the nature of things; to discover an art of Indication and Direction, whereby all other arts with their axioms and works may be detected and brought to light. For this I have with good reason set down as wanting.

This Art of Indication (for so I call it) has two parts. For the indication either proceeds from one experiment to another; or else from experiments to axioms; which axioms themselves suggest new experiments. The one of these I will term Learned Experience, the other Interpretation of Nature, or the New Organon. But the former (as I have hinted elsewhere) must hardly be esteemed an art or a part of philosophy, but rather a kind of sagacity; whence likewise (borrowing the name from the fable) I sometimes

call it the Hunt of Pan. Nevertheless as a man may proceed on his path in three ways: he may grope his way for himself in the dark; he may be led by the hand of another, without himself seeing anything; or lastly, he may get a light, and so direct his steps; in like manner when a man tries all kinds of experiments without order or method, this is but groping in the dark; but when he uses some direction and order in experimenting, it is as if he were led by the hand; and this is what I mean by Learned Experience. For the light itself, which was the third way, is to be sought from the Interpretation of Nature, or the New Organon.

Learned Experience, or the Hunt of Pan, treats of the methods of experimenting; and (since I have set it down as wanting, and the thing itself is not altogether obvious) I will here, according to my plan and custom, give some shadow of it. The method of experimenting proceeds principally either by the Variation, or the Production, or the Translation, or the Inversion, or the Compulsion, or the Application, or the Conjunction, or finally the Chances, of experiment. None of these however extend so far as to the invention of any axiom. For all transition from experiments to axioms, or from axioms to experiments, belongs to that other part, relating to the New Organon.

Variation of experiment takes place first in the Matter; that is, when in things already known an experiment has scarcely been tried except in a certain kind of matter, but now is tried in other things of a like kind; as the manufacture of paper has been only tried in linen, not in silks (except perhaps among the Chinese); nor yet in hair stuffs, from which what are called chamblets are made; nor in wools, cotton, and

skins; though these three last seem to be more heterogeneous, so that they may be more useful if mixed together than separate. Grafting again is common in fruit trees, but has been seldom tried on wild trees; though it is said that the elm when grafted on the elm produces a wonderful foliage. Grafting in flowers is likewise very rare, though now it is sometimes done in musk-roses, which are successfully inoculated with the common roses. Variation in the part of a thing I likewise set down among variations in matter. For we see that a sucker grafted on the trunk of a tree grows better than if planted in the ground. Why then should not the seed of an onion, inserted into the head of another onion when green, grow better than if sown by itself in the ground? Here the root is substituted for the trunk, so that this may be regarded as a kind of grafting in the root. Variation of experiment takes place secondly in the efficient. The rays of the sun are so intensified in heat by burning-glasses, that they can set on fire any combustible matter; can the rays of the moon by the same process be actuated to any degree of heat however mild? that we may see whether all heavenly bodies have the power of heating. So again, radiant heats are increased by glasses; can the same effect be produced on opaque heats (as of stones and metals, before they are red-hot), or has light something to do with it? So again amber and jet when rubbed attract straws; will they do the same when warmed by fire? Variation of experiment takes place thirdly in Quantity; which must be treated with great care, as it is surrounded by many errors. For men believe that if the quantity be increased or multiplied, the power and virtue is increased or multiplied

proportionately. And this they postulate and suppose as if it had a kind of mathematical certainty; which is utterly false. A leaden ball of a pound weight dropped from a tower reaches the ground in (say) ten seconds: will a ball of two pounds weight (in which the force of natural motion, as they call it, ought to be doubled) reach the ground in five seconds? No, but it will take almost the same time in falling, and will not be accelerated in proportion to the increase of quantity. Again, suppose one drachm of sulphur mixed with half a pound of steel will melt it and make it liquid; will therefore one ounce of sulphur mixed with four pounds of steel be able to melt it? This does not follow; for it is certain that the obstinacy of matter in the patient is more increased by quantity than the active power of the agent. Besides, both over-much and over-little equally prejudice the effect. For in the smelting and refining of metals it is a common error to suppose that in order to advance the smelting either the heat of the fire or the quantity of the added ingredient should be increased; whereas, if these surpass the due proportion, they retard the operation; because by their power and acrimony they turn much of the pure metal into fumes, and carry it off, so as both to cause a loss of metal and to make the remaining mass more hard and intractable. Men should therefore consider the story of the woman in Æsop, who expected that with a double measure of barley her hen would lay two eggs a day; whereas the hen grew fat and laid none. As a rule then, it will not be safe to rely on any experiment in nature, unless it has been tried both in greater and lesser quantities. And so much for Variation of Experiment.

Production of experiment is of two kinds; repetition and extension; that is when the experiment is either repeated, or urged to some effect more subtle. As an instance of repetition: spirit of wine is made from wine by a simple distillation, and is much more pungent and stronger than wine itself; will then spirit of wine, if it be itself distilled and clarified, proportionately exceed itself in strength? But repetition also is not free from fallacy. For in the second exaltation the difference is not so great as in the first; and besides, by the repetition of an experiment, after the operation has reached a certain standing point or *acme*, nature oftentimes is so far from advancing that she rather inclines to relapse. Judgment therefore is to be exercised in this matter. Again, quicksilver put into linen or into the middle of molten lead when it is beginning to cool again, becomes solid, and is no longer fluid; will therefore this same quicksilver, by many repetitions of the operation, become fixed and malleable? As an example of extension; if water be put into a glass with a long neb and hung up, and then the neb be dipped into a mixture of wine and water underneath, it will separate the water from the wine, the wine gradually rising to the top, the water sinking to the bottom; will it likewise happen that as wine and water (being different bodies) are by this device separated, so the finer parts of wine (being of the same body) may be separated from the more gross; so that there shall take place a kind of distillation by gravity, and a substance shall be found on the top much like spirits of wine, but perhaps more delicate? Again, a magnet attracts a solid piece of iron; will a piece of a magnet dipped in a dissolution of iron, attract the iron

itself and so get a coating of iron? Again, the magnetic needle turns to the pole; does it in so doing follow the same course as the heavenly bodies? As if one should turn the needle the wrong way, that is point it to the south, and hold it there for a while, and then let it go; would it, in returning to the north, go round by the west rather than by the east? Again, gold imbibes quicksilver when contiguous to it; does it receive this quicksilver into itself without extending its bulk, and so become a body heavier than gold itself? Again, men help the memory by putting images of persons in places; could the same thing be done without the places, by connecting actions or habits with persons? And so much for the Production of Experiment.

Translation of experiment is of three kinds: either from nature or chance into an art; or from one art or practice into another; or from a part of one art into a different part of the same. Of translation from nature or chance into an art there are innumerable examples; for almost all mechanical arts have sprung from small beginnings presented by nature or chance. It was received as an adage "that one cluster of grapes ripens faster by the side of another;" which has grown into a common saying, as applied to the mutual services and offices of friendship. But our cyder makers have an excellent way of imitating the operation. For they take care not to bruise or squeeze the apples till they have lain together for awhile in heaps, and so ripened by mutual contact; that the too great acidity of the drink may be corrected. Again, the artificial imitation of rainbows, with drops thickly sprinkled, is translated by an easy passage from natural rainbows formed by a

dripping cloud. Again, the method of distilling may have been drawn either from above, that is, from showers and dew; or from that homely experiment of drops adhering to the lids of pans of boiling water. Nor would a man have ventured to imitate thunder and lightning, if it had not been suggested by the pot lid of the monkish chemist suddenly flying up with great force and a loud report. The more plentiful the examples however, the fewer need be adduced. But if men were at leisure to inquire after useful things, they ought to observe attentively and minutely and systematically all natural works and operations, and be ever eagerly considering which of them may be transferred to the arts. For nature is the mirror of art. Nor are the experiments fewer in number which may be transferred from one art to another, or from one practice to another; although the thing is not so common. For nature meets everybody everywhere; but particular arts are only known to their own artists. Spectacles have been invented to assist weak sight; might not some instrument be devised, which being applied to the ear would assist those dull of hearing? Dead bodies are preserved by honey and embalming; could not something of the same kind be transferred to medicine for the benefit of live bodies? The practice of sealing upon wax, cements, and lead is of old date; but it led to impressions on paper, or the art of printing. In cookery, salt preserves meat, and that better in winter than summer; might not this be profitably transferred to baths, to regulate their temperament, when necessary, by impression or extraction? So in the late experiment of artificial freezing, salt is discovered to have great powers of condensing; may

not this be transferred to the condensations of metals? seeing it is already known that strong waters composed of certain salts precipitate small sands of gold from certain metals not so dense as gold itself? So again, painting revives the memory of a thing by the image of it; has not this been transferred into the art which they call the art of memory? Of these things it may be said generally, that the best chance of bringing down as from heaven a shower of inventions at once useful and new, is to bring within the knowledge of one man, or of a few who may sharpen one another by conference, the experiments of a number of mechanical arts; that by this translation (as I call it) of experiments the arts may mutually cherish and as it were kindle one another by mixture of rays. For though the rational method of inquiry by the Organon promises far greater things in the end, yet this sagacity proceeding by Learned Experience will in the meantime present mankind with a number of inventions which lie near at hand, and scatter them like the donatives that used to be thrown among the people. There remains the translation from one part of an art to a different part; which differs little from the translation from one art into another. But as some arts are so extensive that the translation of experiments may take place within them, I have thought it right to annex this kind also; especially as in some arts it is of great importance. For it would tend greatly to the advancement of the art of medicine if the experiments of that part which relates to the cure of diseases were transferred to the parts that are concerned with the preservation of health and the prolongation of life. For if an excellent opiate is able to assuage the raging fever of the

spirits in a dangerous disease, it need not be doubted that something of a similar nature, made familiar to the system by well-proportioned doses, may likewise in some measure check and retard that continually advancing and creeping fever which is the effect of age. And so much for the Translation of Experiment.

Inversion of Experiment takes place when trial is made of the contrary of that which has been by the experiment proved. For instance, heat is increased by burning-glasses; is cold also? Again, heat spreads round, but with a tendency upwards; does cold spread round with a tendency downwards? For example: take an iron rod and heat it at one end; then raise it, with the heated part downwards and the hand above; it will burn the hand at once: hold it with the heated part upwards and the hand below, it will be much longer in doing so. But how if the whole bar be heated, and one end touched with snow or with a sponge dipped in cold water? will the cold travel downwards, if the snow or sponge be applied to the top, faster than upwards if applied to the bottom? Again, the rays of the sun are reflected from white but collected on black; are shadows likewise lost on black and collected on white? As we see in a dark room, where the light is only let in by a little chink, that the images of things outside are received on a white paper, but not on a black. Again, the megrims are relieved by opening a vein in the forehead; is a pain in the forehead relieved by scarifying the skull? And so much for the Inversion of Experiment.

Compulsion of Experiment is when an experiment is urged and extended to the annihilation or deprivation of the power; for in the other hunts the prey is only

caught, but in this it is killed. Here is an example of compulsion. The magnet attracts iron; urge the iron or the magnet till it can attract no longer; for instance, if the loadstone be burnt, or steeped in aqua fortis, will it lose its power entirely or for a time? On the other hand, if iron or steel be reduced to oxide of iron, or to what is termed prepared steel, or if it be dissolved in aqua fortis, will it still be attracted by the loadstone? Again, the magnet attracts iron through all mediums we know of; as gold, silver, and glass; find some medium, if it be possible, which will intercept the power; try quicksilver; try oil, gums, ignited coal, and other things, hitherto untried. Again, glasses have lately been invented which magnify minute visible objects in a wonderful manner; urge the use of them to objects either so small as to be beyond their power or so large as to confound it. Thus, can they clearly detect in urine things otherwise imperceptible? Can they discover specks or flaws in jewels which appear every way clear and bright? Can they make the motes in the sunbeams (which were objected most unjustly to Democritus as if they were his atoms and principles of things) appear like great bodies? or a thick powder of vermilion and white lead appear so distinct that the red and the white grains shall be seen separately? Again, can they magnify larger figures (say a face, or an eye) as much as they can a flea or a mite? Can they make a piece of cambric, or any of these finer and more open linen textures, appear full of holes, like a net? But on the compulsions of experiments I dwell the less, because they commonly fall outside the limits of learned experience, and are rather referred to causes, and axioms, and the New Organon. For wherever a case

is established of negation, privation, or exclusion, there is some light given towards the invention of Forms. And so much for the Compulsion of Experiment.

Application of Experiment is nothing but the ingenious translation of it to some other useful experiment. For instance; all bodies have their own dimensions and gravities; gold has more weight, but less dimension than silver; water than wine. From this is derived a useful experiment; for by taking the bulk and the weight you may know how much silver has been mixed with gold, or how much water with wine; which was the εὕρηκα of Archimedes. Again, flesh putrefies sooner in some cellars than in others; it would therefore be useful to apply this experiment to the discovery of airs more or less healthy to live in; those namely, in which flesh is longest in putrefying. The same method may be applied to discover healthy and unhealthy seasons of the year. But there are innumerable instances of this kind. Let men only watch, and keep their eyes continually turned to the nature of things on one side, and to the uses of man on the other. And so much for the Application of Experiment.

Coupling of Experiment is the link or chain of applications; when things which would be ineffectual singly are effectual in conjunction. For example; you wish to have roses or fruit come late. It will be effected, if you pluck off the earlier buds; it will be effected likewise if you uncover the roots and expose them to the air until the middle of spring; but much more if the two be coupled together. Again, ice and nitre have both of them great power of refrigeration; much more when mixed. This is indeed clear of itself. And yet there may often be a deception in it (as in all

things else where axioms are wanting), if the things sc coupled be such as operate in different and contrary ways. And so much for Coupling of Experiment.

There remain the Chances of Experiment. This form of experimenting is merely irrational and as it were mad, when you have a mind to try something, not because reason or some other experiment leads you to it, but simply because such a thing has never been attempted before. Yet I know not but in this very process (of which we are now treating) some great thing may be involved; the leaving (I say) of no stone in nature unturned. For the *magnalia* of nature generally lie out of the common roads and beaten paths, so that the very absurdity of the thing may sometimes prove of service. But if reason go along with it; that is, if it be evident that an experiment of this nature has never been tried, and yet there is great reason why it should be tried; then it is one of the best ways, and plainly shakes out the folds of nature. For instance, when fire works upon a natural body, one of two things has hitherto always happened; — either that something flies out (as flame and smoke in common combustion), or at least that there is a local separation of the parts, and to some distance; as in distillation, where the dregs settle at the bottom, and the vapours, after they have had their play, are gathered into receptacles. But of what I may call *close distillation* no man has yet made trial. Yet it seems probable that the force of heat, if it can perform its exploits of alteration within the enclosure of the body, where there is neither loss of the body nor yet means of escape, will succeed at last in handcuffing this Proteus of matter, and driving it to many transformations; only the heat must be so regulated and varied,

that there be no fracture of the vessels. For this operation is like that of the womb, where the heat works, and yet no part of the body is either emitted or separated. In the womb indeed alimentation is conjoined; but as far as conversion is concerned it seems to be the same thing. Such then are the Chances of Experiment.

Meanwhile I give this advice as to experiments of this nature; that no one should be disheartened or confounded if the experiments which he tries do not answer his expectation. For though a successful experiment be more agreeable, yet an unsuccessful one is oftentimes no less instructive. And it must ever be kept in mind (as I am continually urging) that experiments of Light are even more to be sought after than experiments of Fruit. And so much for Learned Experience, which (as I have already said) is rather a sagacity and a kind of hunting by scent, than a science. Of the New Organon I say nothing, nor shall I give any taste of it here; as I purpose by the divine favour to compose a complete work on that subject, — being the most important thing of all.

CHAP. III.

Division of the art of discovery of Arguments into Promptuary *and* Topics. *Division of Topics into* General *and* Particular. *Example of a Particular Topic in an Inquiry concerning Heavy and Light.*

THE invention of arguments is not properly an invention; for to invent is to discover that we know not,

not to recover or resummon that which we already know. Now the use and office of this invention is no other than out of the mass of knowledge which is collected and laid up in the mind to draw forth readily that which may be pertinent to the matter or question which is under consideration. For to him who has little or no knowledge on the subject proposed, places of invention are of no service; and on the other hand, he who is ready provided with matter applicable to the point in question will, even without art and places of invention (although perhaps not so expeditiously and easily), discover and produce arguments. So (as I have said) this kind of invention is not properly an invention, but a remembrance or suggestion with an application. Nevertheless, as the name has come into use, let it be called invention; for the hunting of any wild animal may be called a finding of it, as well in an enclosed park as in a forest at large. But not to be nice about words, let it be clearly understood, that the scope and end of this invention is readiness and present use of our knowledge, rather than addition or amplification thereof.

Provision for discourse may be procured in two ways. The place where a thing is to be looked for may be marked, and as it were indexed; and this is that which I call *Topics;* or arguments concerning such matters as commonly fall out and come under discussion may be composed beforehand and laid up for use: and this I will name the *Promptuary.* This last however scarcely deserves to be spoken of as a part of knowledge, consisting rather of diligence than of any artificial erudition. And herein Aristotle wittily, but hurtfully, derides the sophists of his time, saying, "they

did as if one that professed the art of shoemaking, should not teach how to make a shoe, but only exhibit a number of shoes of all fashions and sizes."[1] But here a man might reply, that if a shoemaker should have no shoes in his shop, but only work as he is bespoken, he should be still a poor man, and have few customers. Far otherwise says our Saviour, speaking of divine knowledge, "Every scribe that is instructed in the kingdom of heaven is like a householder, that bringeth forth old and new store."[2] We see likewise that the ancient rhetoricians gave it in precept to pleaders, that they should have by them a variety of commonplaces, ready prepared, and handled and illustrated on both sides; arguments (for example) for the sense of the law against the words of the law; and the contrary: for inferences against testimony, and the contrary. And Cicero himself, taught by long experience, directly asserts that a diligent orator may have by him premeditated and carefully handled beforehand everything which he shall have occasion to speak of; so that in the pleading of any particular cause, he shall not have to introduce anything new or on the sudden, except names and some special circumstances.[3] But such was the diligence and exactness of Demosthenes, that seeing what great force the entrance and access into a cause has to make a good impression on the minds of the audience, he thought it worth while to compose and have ready by him a number of prefaces for orations and speeches. All which authorities and precedents may fairly overweigh Aristotle's opinion, who would have us change a rich wardrobe for a pair

[1] Arist. De Repreh. Sophist. ii. 9. [2] St. Matt. xiii. 52.
[3] Cic. De Oratore, ii. 32—34.

of shears. Therefore that part of knowledge concerning provision or preparatory store was not to be omitted, though here I have said enough respecting it. For as it is common to both, logic as well as rhetoric, I have chosen in treating of logic only to mention it by the way, referring the fuller discussion of it to rhetoric.

The other part of invention (namely Topics) I will divide into general and particular. General has been sufficiently handled in logic, so that there is no need to dwell on the explanation of it. Only it may be observed by the way, that this kind of Topic is of use not only in argumentations, where we are disputing with another, but also in meditations, where we are considering and resolving anything with ourselves; neither does it serve only to prompt and suggest what we should affirm and assert, but also what we should inquire or ask. For a faculty of wise interrogating is half a knowledge. For Plato says well, "whosoever seeks a thing, knows that which he seeks for in a general notion; else how shall he know it when he has found it?" And therefore the fuller and more certain our anticipation is, the more direct and compendious is our search. The same places therefore which will help us to shake out the folds of the intellect within us, and to draw forth the knowledge stored therein, will also help us to gain knowledge from without; so that if a man of learning and experience were before us, we should know how to question him wisely and to the purpose; and in like manner how to select and peruse with advantage those authors, books, and parts of books, which may best instruct us concerning that which we seek.

But Particular Topics contribute much more to those

purposes whereof I speak, and are to be accounted most useful. Of these there is indeed some slight mention in some writers, but they have not been fully handled, according to the dignity of the subject. But leaving the humour which has reigned too long in the schools, — which is to pursue with infinite subtlety the things which are near at hand, and never to go near those which lie a little further off, — I for my part receive particular Topics (that is places of invention and inquiry appropriated to particular subjects and sciences) as things of prime use. They are a kind of mixtures of logic with the proper matter of each science. For he must be a trifler and a man of narrow mind who thinks that the perfect art of invention of knowledge can be devised and propounded all at once; and that then it needs only to be set at work. Let men be assured that the solid and true arts of invention grow and increase as inventions themselves increase; so that when a man first enters into the pursuit of any knowledge, he may have some useful precepts of invention; but when he has made further advances in that knowledge, he may and ought to devise new precepts of invention, to lead him the better to that which lies beyond. It is indeed like journeying in a champaign country; for when we have gone some part of our way, we are not only nearer to our journey's end, but we can likewise see better that part of the way which remains. In the same manner in sciences every step forward on the journey gives a nearer view of that which is to come. But I have thought right to annex an example of this kind of Topic, seeing I set it down among the Deficients.

A Particular Topic, or Articles of Inquiry concerning Heavy and Light.

1. Inquire what bodies are susceptible of the motion of gravity, what of levity, and if there be any of an intermediate and indifferent nature.

2. After the simple inquiry concerning heavy and light, proceed to comparative inquiry; as what heavy bodies weigh more, what less, in the same dimensions. Likewise of light bodies, which rise quicker, which slower.

3. Inquire what effect the quantity of a body has in the motion of gravity. At first sight indeed this may appear superfluous; for the proportions of motion ought to follow the proportions of quantity; but the case is otherwise. For although in the scales the quantity of a body makes up the gravity (the force of the body being there collected, by the recoil or resistance of the scales or beam), yet where there is but little resistance (as in the fall of bodies through air) the velocity of the fall is little hastened by the quantity of the body; for a ball of twenty pounds weight falls to the ground in nearly the same time as a ball of one pound.

4. Inquire whether the quantity of a body can be so increased as entirely to lose the motion of gravity; as in the earth, which is pendulous, but falls not. Can there then be other substances so massive as to support themselves? For the motion towards the centre of the earth is a fiction; and every great mass abhors all local motion, unless it be overcome by another stronger appetite.

5. Inquire what power and operation the resistance

of an intervening or opposing body may have to control the motion of gravity. For a descending body either cuts and penetrates through an opposing body, or is stopped by it. If it pass through, penetration takes place either with slight resistance, as in air, or with a stronger, as in water. If it be stopped, it is either by an unequal resistance, where there is a superiority of weight, as if wood be placed on the top of wax; or by an equal resistance, as if water be placed on the top of water, or wood upon wood of the same kind; which is what the schoolmen (upon no solid apprehension) term the non-gravitation of a body in its own place. And all these things vary the motion of gravity. For heavy things move one way in the scales, and another in falling; one way (which may seem strange) when the scales are hanging in the air, another when they are sunk in water; one way again in falling through water, another in floating or being carried upon it.

6. Inquire what power and operation the figure of a descending body has in directing the motion of gravity; as if a figure be broad and thin, cubic, oblong, round, pyramidal; also when bodies turn, and when they keep the same position in which they were let fall.

7. Inquire what power and operation the continuation and progression of the descent or fall has in increasing the velocity and impetus, and in what proportion and to what extent that velocity will increase. For the ancients upon slight consideration imagined that this motion, being natural, was continually increasing and strengthening.

8. Inquire what power and operation the distance

or nearness of the falling body to the earth has, in making it fall quicker or slower, or not at all (if it be beyond the orb of the earth's activity, according to Gilbert's opinion); and also what is the effect of the plunging of a descending body further into the depths of the earth, or of the location thereof nearer the surface. For this also varies the motion, as is perceived by miners.

9. Inquire what power and operation the difference of the bodies has, through which the motion of gravity is diffused and communicated; and whether it is communicated as well through soft and porous bodies, as through hard and solid ones; as if the beam of a pair of scales on one side of the tongue be made of wood, on the other of silver (though both be reduced to the same weight), will it produce any variation in the scales? Likewise will metal laid on wood, or on a blown bladder, weigh the same as it does on the bottom of the scale?

10. Inquire what power and operation the distance of the body from the fulcrum has in the communication of the motion of gravity; that is, in the sooner or later perception of the weight or pressure: as in scales, if one arm of the beam be longer than the other (though both are of the same weight), does this of itself incline the scale? or in the syphon, where the longer limb will certainly draw the water, though the shorter (being made more capacious) contain a greater weight of it.

11. Inquire what power the mixing or coupling of a light body with a heavy one has in lessening the gravity of a body; as in the weight of animals alive and dead.

12. Inquire of the secret ascents and descents of the lighter and heavier parts in one entire body; whence fine separations often take place; as in the separation of wine and water, the rising of cream, and the like.

13. Inquire what is the line and direction of the motion of gravity; how far it follows the centre or mass of the earth, how far the centre of the body itself, that is the strife and pressure of its parts. For these centres, though convenient for demonstrations, are of no effect in nature.

14. Inquire touching the motion of gravity as compared with other motions; what motions it overcomes, and what overcome it. As in violent motion (as it is called) the motion of gravity is overpowered for a time; and as when a little magnet lifts a piece of iron much heavier than itself, the motion of gravity yields to the motion of sympathy.

15. Inquire touching the motion of air; whether it rise upwards, or is as it were indifferent. And this is hard to discover, except by some subtle experiments. For the springing up of air at the bottom of water is rather caused by the force of the water than the motion of the air; seeing that the same thing happens also with wood. But air mingled with air gives no evidence, seeing that air in air appears no less light, than water in water appears heavy; but in a bubble, where there is a thin film drawn round it, it is stationary for a time.

16. Inquire what is the limit of lightness; for men do not mean (I suppose) that as the centre of the earth is the centre of gravity, so the extreme convexity of the heaven is the term of lightness; is it that as heavy

bodies seem to fall till they rest and reach the immovable, so light bodies rise till they begin to rotate, and attain as it were motion without limit?

17. Inquire why vapours and exhalations rise as high as what is called the middle region of the air; seeing they consist of a somewhat heavy matter, and the rays of the sun at intervals (that is, at night) cease their operation.

18. Inquire of the rule which governs the upward motion of flame; which is the more mysterious as flame expires every instant, except perhaps it be in the midst of larger flames; for flames separated from their continuity last but a little while.

19. Inquire of the upward motion of the activity of heat; as when the heat of red-hot iron spreads faster upwards than downwards.

Such then is an instance of a Particular Topic. In the meantime I again repeat my former advice; namely, that men ought so to vary their particular topics, as, after any great advance has been made in the inquiry, to set out another and again another topic, if they desire to climb the heights of the sciences. But so much importance do I attribute to Particular Topics, that I design to construct a special work concerning them in the more important and obscure subjects of nature. For we can command our questions, though we cannot command the nature of things. And so much for Invention.

CHAP. IV.

Division of the art of Judging into judgment by Induction *and judgment by* Syllogism. *The first whereof is referred to the New Organon. First division of Judgment by Syllogism into* Reduction Direct *and* Reduction Inverse. *Second division of the same into* Analytic *and doctrine concerning* Detection of Fallacies. *Division of the doctrine concerning the detection of fallacies into detection of* Sophistical *fallacies, fallacies of* Interpretation, *and fallacies of* false appearances or Idols. *Division of Idols into Idols of the* Tribe, *Idols of the* Cave, *and Idols of the* Marketplace. *Appendix to the Art of Judging; viz. concerning the* Analogy of Demonstrations according to the nature of the subject.

LET us now pass on to Judgment, or the art of judging, which handles the nature of proofs and demonstrations. In this art (as indeed it is commonly received) the conclusion is made either by induction or by syllogism. For enthymems and examples are but abridgments of these two. With regard however to judgment by induction there is nothing to detain us; for here the same action of the mind which discovers the thing in question judges it; and the operation is not performed by help of any middle term, but directly, almost in the same manner as by the sense. For the sense in its primary objects at once apprehends the appearance of the object, and consents to the truth thereof. In the syllogism it is otherwise; for there the proof is not immediate, but by mean. And therefore the invention of the mean is one thing, and the judgment of the consequence is another; for the mind ranges first, and rests afterwards. But the vicious

form of induction I entirely disclaim; and as for the legitimate form, I refer it to the New Organon. Enough here therefore of Judgment by Induction.

For the other judgment by Syllogism, what need to speak; seeing it has been beaten over and over by the subtlest labours of men's wits and reduced to many niceties? And no wonder, for it is a thing most agreeable to the mind of man. For the mind of man is strangely eager to be relieved from suspense, and to have something fixed and immovable, upon which in its wanderings and disquisitions it may securely rest. And assuredly as Aristotle endeavours to prove that in all motion there is some point quiescent; and as he very elegantly interprets the ancient fable of Atlas, who stood fixed and supported the heaven on his shoulders, to be meant of the poles or axletree of heaven, whereupon the conversion is accomplished;[1] so do men earnestly desire to have within them an Atlas or axletree of the thoughts, by which the fluctuations and dizziness of the understanding may be to some extent controlled; fearing belike that their heaven should fall. And hence it is that they have been in too great a hurry to establish some principles of knowledge, round which all the variety of disputations might turn, without peril of falling and overthrow; not knowing that he who makes too great haste to grasp at certainties shall end in doubts, while he who seasonably restrains his judgment shall end in certainties.

So then this art of judgment by Syllogism is but the reduction of propositions to principles in a middle term; the principles being understood as agreed upon and exempted from argument; and the invention of

[1] Arist. De Mot. Anim. 2 and 3.

the middle terms left to the free exercise of wit and inquiry. Now this reduction is of two kinds: direct and inverse; direct, when the proposition is reduced to the principle; which they term proof *ostensive;* inverse, when the contradictory of the proposition is reduced to the contradictory of the principle; which they call proof *per incommodum*, or by showing that it involves an absurdity. But the number of series or middle terms is greater or less as the proposition stands more or less removed from the principle.

This being premised, I will divide the art of judgment (according to the usual manner) into Analytic, and the doctrine concerning *Elenches*, or detection of fallacies; whereof the one proceeds by way of direction, the other by way of caution. Analytic sets down true forms of consequences in argument; from which if there be any variation or deflexion, the conclusion is detected to be faulty; and this contains in itself a kind of detection, or refutation: for the straight (as they say) indicates what is not straight as well as what is. And yet it is safest to employ Elenches, as monitors, for the better detection of fallacies by which the judgment would otherwise be ensnared. In Analytic however I find no deficiency; but it is rather overladen with superfluities than in need of additions.

The doctrine of detection of fallacies I divide into three parts; detection of *sophistical* fallacies, of fallacies of *interpretation*, and of *false appearances* or *Idols*. The detection of sophistical fallacies is especially useful. For although the grosser kind of fallacies is well compared by Seneca[1] to the feats of jugglers, in which though we know not how the thing is done, yet we

[1] Seneca, Epist. 45.

know well it is not as it seems to be; yet the more subtle sophisms not only put a man beside his answer, but many times seriously confound his judgment.

This part concerning the detection of sophistical fallacies is excellently handled by Aristotle in the way of precepts, but still more excellently by Plato in the way of examples; and that not only in the persons of the ancient sophists (Gorgias, Hippias, Protagoras, Euthydemus, and the rest), but even in Socrates himself, who professing to affirm nothing, but to infirm that which was affirmed by another, has most wittily expressed all the forms of fallacy, objection, and redargution. In this part therefore I have no deficiency to report. In the meantime I may observe, that although I have said that the honest and principal use of this doctrine is for redargution of sophisms; yet it is manifest that the degenerate and corrupt use is for raising, by means of these very sophisms, captions and contradictions. And this passes for a great faculty, and no doubt is of very great advantage; though the difference be good which was made between an orator and a sophist, that the one is as the greyhound, which has his advantage in the race, the other as the hare, which has her advantage in the turn.

Next come fallacies of Interpretation; for so (borrowing the name rather than the sense from Aristotle) I will term them. Let me call to mind then what I said above (in speaking of Primitive or Summary Philosophy) touching the Transcendental or Adventitious Conditions or Adjuncts of Essences. These are Greater, Less, Much, Little, Before, After, Identity, Diversity, Potential, Actual, Habit, Privation, Whole, Parts, Active, Passive, Motion, Rest, Entity, Nonen-

tity, and the like. And first let the different ways which I mentioned of viewing these things be remembered and noted; namely that they may be inquired either physically or logically. Now the physical handling of them I referred to Primitive or Summary Philosophy. There remains then the logical. And this is the very thing which at present I mean by the doctrine of the detection of fallacies of Interpretation. Certainly it is a sound and good part of learning. For common and general notions enter necessarily into every discussion; so that unless great care be taken to distinguish them well at the outset, all the light of disputations will be strangely clouded with darkness by them, and the matter end in disputes about words. For equivocations and false acceptations of words (especially of this sort) are the sophisms of sophisms; and therefore I have thought it better that the treatment of them should be made a part by itself, than that it should either be included in Summary Philosophy or Metaphysic, or placed partly under Analytic; as has been done by Aristotle confusedly enough. The name I have given it is taken from the use; because its true use is simply redargution and caution with regard to the use of words. Moreover that part concerning the Predicaments, if rightly managed, relating to cautions against confounding and transposing the terms of definitions and divisions, I hold to be of principal use, and wish it to be referred to this place. And so much for the Detection of Fallacies of Interpretation.

As for the detection of False Appearances or Idols, Idols are the deepest fallacies of the human mind. For they do not deceive in particulars, as the others do, by clouding and snaring the judgment; but by a

corrupt and ill-ordered predisposition of mind, which as it were perverts and infects all the anticipations of the intellect. For the mind of man (dimmed and clouded as it is by the covering of the body), far from being a smooth, clear, and equal glass (wherein the beams of things reflect according to their true incidence), is rather like an enchanted glass, full of superstition and imposture. Now idols are imposed upon the mind, either by the nature of man in general; or by the individual nature of each man; or by words, or nature communicative. The first of these I call Idols of the *Tribe*, the second the Idols of the *Cave*, the third the Idols of the *Market-place*. There is also a fourth kind which I call the Idols of the *Theatre*, superinduced by corrupt theories or systems of philosophy, and false laws of demonstration. But this kind may be rejected and got rid of: so I will leave it for the present. The others absolutely take possession of the mind, and cannot be wholly removed. In these therefore Analytic is not to be looked for; but the doctrine of Elenches is with regard to the idols themselves a primary doctrine. Nor (to say truth) can the doctrine concerning Idols be reduced to an art; all that can be done is to use a kind of thoughtful prudence to guard against them. The full and subtle handling of these however I reserve for the New Organon, making here only a few general observations touching them.

As an example of the Idols of the Tribe, take this. The nature of the human mind is more affected by affirmatives and actives than by negatives and privatives; whereas by right it should be indifferently disposed towards both. But now a few times hitting or

presence produces a much stronger impression on the mind than many times failing or absence: a thing which is as the root of all vain superstition and credulity. And therefore it was well answered by one who when the table was shown to him hanging in a temple of such as had paid their vows upon escape from shipwreck, and he was pressed to say whether he did not now acknowledge the power of Neptune, "Yea," asked he in return, "but where are they painted that were drowned after paying their vows?" And so it is in similar superstitions, as astrology, dreams, omens, and the like. Here is another instance. The spirit of man (being of an equal and uniform substance) presupposes and feigns in nature a greater equality and uniformity than really is. Hence the fancy of the mathematicians that the heavenly bodies move in perfect circles, rejecting spiral lines. Hence also it happens, that whereas there are many things in nature unique and full of dissimilarity, yet the cogitation of man still invents for them relatives, parallels, and conjugates. Hence sprang the introduction of an element of fire, to keep square with earth, water, and air. Hence the chemists have marshalled the universe in phalanx; conceiving, upon a most groundless fancy, that in those four elements of theirs (heaven, air, water, and earth,) each species in one has parallel and corresponding species in the others. The third example is of kin to the last; Man is as it were the common measure and mirror of nature. For it is not credible (if all particulars be gone through and noted) what a troop of fictions and idols the reduction of the operations of nature to the similitude of human actions has brought into natural philosophy; I mean, the fancy

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that nature acts as man does. Neither are these much better than the heresy of the Anthropomorphites, bred in the cells of gross and solitary monks; or the opinion of Epicurus answering to the same in heathenism, who supposed the gods to be of human shape. And therefore Velleius the Epicurean needed not to have asked, "Why God should have adorned the heaven with stars and lights, like an ædile?"[1] For if that great workmaster had acted as an ædile, he would have cast the stars into some pleasant and beautiful order, like the frets in the roofs of palaces; whereas one can scarce find a posture in square or triangle or straight line amongst such an infinite number. So differing a harmony is there between the spirit of man and the spirit of nature.

With regard to the Idols of the Cave, they arise from each man's peculiar nature both of mind and body; and also from education and custom, and the accidents which befall particular men. For it is a most beautiful emblem, that of Plato's cave: for (not to enter into the exquisite subtlety of the allegory) if a child were kept in a dark grot or cave under the earth until maturity of age, and then came suddenly abroad, and beheld this array of the heavens and of nature, no doubt many strange and absurd imaginations would arise in his mind. Now we, although our persons live in the view of heaven, yet our spirits are included in the caves of our own bodies; so that they must needs be filled with infinite errors and false appearances, if they come forth but seldom and for brief periods from their cave, and do not continually live in the contemplation of nature, as in the open air. And

[1] Cicero De Nat. Deor. i. c. 9.

with this emblem of Plato's concerning the cave the saying of Heraclitus agrees well, "that men seek the sciences in their own proper worlds, and not in the greater world." [1]

But the Idols of the Market-place are most troublesome; which have crept into the understanding through the tacit agreement of men concerning the imposition of words and names. Now words are generally framed and applied according to the conception of the vulgar, and draw lines of separation according to such differences as the vulgar can follow: and where a more acute intellect or a more diligent observation tries to introduce a better distinction, words rebel. And that which is the remedy for this evil (namely definitions) is in most cases unable to cure it; for definitions themselves consist of words, and words beget words. And although we think we govern our words, and it is easy to say "a man should speak as the vulgar, and think as the wise;" and though technical terms (only used by the learned) may seem to answer the purpose; and the setting down of those definitions I spoke of at the entrance of arts (after the prudent course of the mathematicians) may avail to correct the perverted acceptation of terms; yet all is not enough, but the juggleries and charms of words will in many ways seduce and forcibly disturb the judgment, and (after the manner of the Tartar bowmen) shoot back at the understanding from which they proceeded. This evil stands in need therefore of a deeper remedy, and a new one. But here I only glance at these things by the way; in the meantime pronouncing this doctrine (which I call the Great Elenches, or the doctrine concerning the

[1] Plato, Republ. vi.

Idols of the Human Mind, native and adventitious) to be wanting. The regular handling of it I refer to the New Organon.

There remains an Appendix to the Art of Judging, of great excellency; which I also set down as deficient: for though Aristotle has noticed the thing, he has nowhere followed out the manner of it. It treats of the application of the differing kinds of proofs to the differing kinds of matters or subjects; and may be called the doctrine of the judgment of judgments. For Aristotle rightly observes, "That we ought not to require either demonstrations from orators or persuasions from mathematicians."[1] And therefore if there be an error in the kind of proof employed, the judgment itself cannot be truly made. Now whereas there are four kinds of demonstrations, — either by immediate consent and common notions, or by induction, or by syllogism, or by that which Aristotle rightly calls *demonstration in circle*,[2] — (that is, not from things higher in the order of nature, but as it were from the same level): — so there are certain subjects and matters in science wherein each of these demonstrations respectively does well, and certain others from which they are respectively excluded. For rigour and curiosity in requiring the more severe kinds of proof in some things, and still more facility and remissness in contenting ourselves with the weaker kinds in others, are to be numbered among the chief causes of detriment and hindrance to knowledge. And so much for the Art of Judging.

[1] Arist. Metaph. ii. 3.

[2] Arist. Post. Analyt. ii. 13.

CHAP. V.

Division of the Art of Retaining into the doctrine concerning Helps of Memory, *and the doctrine concerning* Memory itself. *Division of the doctrine concerning Memory itself into* Prenotion *and* Emblem.

THE art of retaining or keeping knowledge I will divide into two parts; namely, the doctrine concerning Helps of Memory, and the doctrine concerning Memory itself. The great help to the memory is *writing;* and it must be taken as a rule that memory without this aid is unequal to matters of much length and accuracy; and that its unwritten evidence ought by no means to be allowed. This is particularly the case in inductive philosophy and the interpretation of nature; for a man might as well attempt to go through the calculations of an Ephemeris in his head without the aid of writing, as to master the interpretation of nature by the natural and naked force of thought and memory, without the help of tables duly arranged. But not to speak of the interpretation of nature, which is a new doctrine, there can hardly be anything more useful even for the old and popular sciences, than a sound help for the memory; that is a good and learned Digest of Common Places. I am aware indeed that the transferring of the things we read and learn into common-place books is thought by some to be detrimental to learning, as retarding the course of the reader and inviting the memory to take holiday. Nevertheless, as it is but a counterfeit thing in knowledge to be forward and pregnant, except a man be also deep and full, I hold diligence and labour in the entry of

common places to be a matter of great use and support in studying; as that which supplies matter to invention, and contracts the sight of the judgment to a point. But yet it is true that of the methods and frameworks of common places which I have hitherto seen, there is none of any worth; all of them carrying in their titles merely the face of a school and not of a world; and using vulgar and pedantical divisions, not such as pierce to the pith and heart of things.

For the Memory itself, the inquiry seems hitherto to have been pursued weakly and languidly enough. An art there is indeed extant of it; but it is clear to me that there might be both better precepts for strengthening and enlarging the memory than that art contains, and a better practice of the art itself than that which is received. Not but (if any one chooses to abuse this art for purposes of ostentation) feats can be performed by it that are marvellous and prodigious; but nevertheless it is a barren thing (as now applied) for human uses. At the same time the fault I find with it is not that it destroys and overburdens the natural memory (which is the common objection), but that it is not well contrived for providing assistance to the memory in serious business and affairs. And for my own part (owing perhaps to the life of business I have led) I am ever disposed to make small account of things which make parade of art but are of no use. For the being able to repeat at once and in the same order a great number of names or words upon a single hearing, or to make a number of verses extempore on any subject, or to make a satirical simile of everything that happens, or to turn any serious matter into a jest, or to carry off anything with a contradiction or cavil,

or the like, (whereof in the faculties of the mind there is great store, and such as by device and practice may be exalted to an extreme degree of wonder,) — all such things I esteem no more than I do the tricks and antics of clowns and rope-dancers. For they are almost the same things; the one an abuse of the powers of the body, the other of the mind; matters perhaps of strangeness, but of no worthiness.

The Art of Memory is built upon two intentions; Prenotion and Emblem. By Prenotion I mean a kind of cutting off of infinity of search. For when a man desires to recall anything into his memory, if he have no prenotion or perception of that he seeks, he seeks and strives and beats about hither and thither as if in infinite space. But if he have some certain prenotion, this infinity is at once cut off, and the memory ranges in a narrower compass; like the hunting of a deer within an enclosure. And therefore order also manifestly assists the memory; for we have a prenotion that what we are seeking must be something which agrees with order. So again verse is more easily learned by heart than prose; for if we stick at any word, we have a prenotion that it must be such a word as fits the verse. And this prenotion is the principal part of artificial memory. For in artificial memory we have the *places* digested and prepared beforehand; the *images* we make extempore according to the occasion. But then we have a prenotion that the image must be one which has some conformity with the place; and this reminds the memory, and in some measure paves the way to the thing we seek. Emblem, on the other hand, reduces intellectual conceptions to sensible images; for an object of sense always strikes the memory

more forcibly and is more easily impressed upon it than an object of the intellect; insomuch that even brutes have their memory excited by sensible impressions; never by intellectual ones. And therefore you will more easily remember the image of a hunter pursuing a hare, of an apothecary arranging his boxes, of a pedant making a speech, of a boy repeating verses from memory, of a player acting on the stage, than the mere notions of invention, disposition, elocution, memory, and action. Other things there are (as I said just now) which relate to the help of memory, but the art as it now is consists of the two above stated. But to follow out the particular defects of arts would be from my purpose. So much therefore for the Art of Retaining or Keeping Knowledge. And now we have arrived in due course at the fourth division of Logic, which treats of the Transmission and Delivery of our knowledge to others.

OF

THE ADVANCEMENT OF LEARNING.

BOOK VI.

CHAPTER I.

Division of the art of Transmitting into the doctrine concerning the Organ of Discourse, *the doctrine concerning the* Method of Discourse, *and the doctrine concerning the* Illustration of Discourse. *Division of the doctrine concerning the organ of discourse into the doctrine concerning the* Notations of Things, *concerning* Speech, *and concerning* Writing; *whereof the two first constitute* Grammar, *and are divisions of it. Division of the doctrine concerning the notations of things into* Hieroglyphics *and* Real Characters. *Second division of Grammar into* Literary *and* Philosophic. *Reference of* Poesy in respect of metre *to the doctrine concerning* Speech. *Reference of the doctrine concerning* Ciphers *to the doctrine concerning* Writing.

It is permitted to every man (excellent King) to make merry with himself and his own matters. Who knows then but this work of mine is copied from a certain old book found in the most famous library of St. Victor, of which Master Francis Rabelais made a catalogue? For there is a book there entitled "The

Ant-hill of Arts." And certainly I have raised up here a little heap of dust, and stored under it a great many grains of sciences and arts; into which the ants may creep and rest for a while, and then prepare themselves for fresh labours. Now the wisest of kings refers sluggards to the ants; and for my part I hold all men for sluggards who care only to use what they have got, without preparing for new seedtimes and new harvests of knowledge.

Let us now proceed to the art of Transmitting, or of producing and expressing to others those things which have been invented, judged, and laid up in the memory; which I will call by a general name the Art of Transmission. This art includes all the arts which relate to words and discourse. For although reason be as it were the soul of discourse, yet in the handling of them reason and discourse should be kept separate, no less than soul and body. The art of transmission I will divide into three parts; the doctrine concerning the Organ of Discourse, the doctrine concerning the Method of Discourse, and the doctrine concerning the Illustration or adornment of Discourse.

The doctrine concerning the Organ of Discourse, which is also called Grammar, has two parts; one relating to Speech, the other to Writing: for Aristotle says rightly that "words are the images of thoughts and letters are the images of words." Both these I assign to Grammar. But to go a little higher up, before I come to Grammar and the parts thereof just mentioned, I must speak concerning the Organ of Transmission in general. For it seems that the art of transmission has some other children besides Words and Letters. This then may be laid down as a rule;

that whatever can be divided into differences sufficiently numerous to explain the variety of notions (provided those differences be perceptible to the sense) may be made a vehicle to convey the thoughts of one man to another. For we see that nations which understand not one another's language carry on their commerce well enough by means of gestures. And in the practice of some who had been deaf and dumb from their birth and were otherwise clever, I have seen wonderful dialogues carried on between them and their friends who had learned to understand their gestures. Moreover it is now well known that in China and the provinces of the furthest East there are in use at this day certain *real characters*, not nominal; characters, I mean, which represent neither letters nor words, but things and notions; insomuch that a number of nations whose languages are altogether different, but who agree in the use of such characters (which are more widely received among them), communicate with each other in writing; to such an extent indeed that any book written in characters of this kind can be read off by each nation in their own language.

The Notes of Things then which carry a signification without the help or intervention of words, are of two kinds: one *ex congruo*, where the note has some congruity with the notion, the other *ad placitum*, where it is adopted and agreed upon at pleasure. Of the former kind are Hieroglyphics and Gestures; of the latter the Real Characters above mentioned. The use of Hieroglyphics is very old, and held in a kind of reverence, especially among the Egyptians, a very ancient nation. So that they seem to have been a kind of earlier born writing, and older than the very ele-

ments of letters, except perhaps among the Hebrews. Gestures are as transitory Hieroglyphics. For as uttered words fly away, but written words stand, so Hieroglyphics expressed in gestures pass, but expressed in pictures remain. For when Periander, being consulted with how to preserve a tyranny, bade the messenger follow him, and went into his garden and topped the highest flowers, hinting at the cutting off of the nobility, he made use of a Hieroglyphic just as much as if he had drawn it on paper. In the meantime it is plain that Hieroglyphics and Gestures have always some similitude to the thing signified, and are a kind of emblems. Whence I have called them "notes of things by congruity." Real characters on the other hand have nothing emblematic in them, but are merely surds, no less than the elements of letters themselves, and are only framed *ad placitum*, and silently agreed on by custom. It is evident however that a vast multitude of them is wanted for writing; for there ought to be as many of them as there are radical words. This portion therefore of the doctrine of the Organ of Discourse, which relates to the Notes of Things, I set down as wanting. And although it may seem to be of no great use, since words and writing by letters are by far the most convenient organs of transmission; yet I thought good to make some mention of it here, as a thing not unworthy of consideration. For we are handling here the currency (so to speak) of things intellectual, and it is not amiss to know that as moneys may be made of other material besides gold and silver, so other Notes of Things may be coined besides words and letters.

Now therefore I pass on to Grammar, which is as it

were the harbinger of other sciences; an office not indeed very noble, yet very necessary; especially as sciences in our age are principally drawn from the learned languages, and are not learned in our mother tongue. Nor must it be esteemed of little dignity, seeing that it serves for an antidote against the curse of the confusion of tongues. For man still strives to renew and reintegrate himself in those benedictions of which by his fault he has been deprived. And as he arms and defends himself against the first general curse of the barrenness of the earth, and of eating bread in the sweat of his face, by the invention of all other arts; so against this second curse of the confusion of tongues he calls in the aid of Grammar; whereof the use in a mother tongue is small; in a foreign tongue more; but most in such foreign tongues as have ceased to be vulgar tongues, and are only extant in books.

Grammar likewise is of two sorts; the one being Literary, the other Philosophical. The one is used simply for languages, that they may be learned more quickly or spoken more correctly and purely; the other ministers in a certain degree to philosophy. And here I am reminded that Cæsar wrote some books on "Analogy;" and a doubt occurs to me, whether they handled this kind of philosophical grammar of which I speak. I suspect however that they did not contain anything very subtle or lofty; but only laid down precepts for a chaste and perfect style, not vitiated or polluted either by a bad habit of speech, or by any particular affectation; in which style himself excelled. Taking the hint however from this, I have thought of a kind of grammar which should diligently inquire, not the analogy of words with one another, but the

analogy between words and things, or reason; not going so far however as that interpretation which belongs to Logic. Certainly words are the footsteps of reason, and the footsteps tell something about the body. I will therefore give some sketch of what I mean. But I must first say that I by no means approve of that curious inquiry, which nevertheless so great a man as Plato did not despise; namely concerning the imposition and original etymology of names; on the supposition that they were not arbitrarily fixed at first, but derived and deduced by reason and according to significance; a subject elegant indeed, and pliant as wax to be shaped and turned, and (as seeming to explore the recesses of antiquity) not without a kind of reverence, — but yet sparingly true and bearing no fruit. But the noblest species of grammar, as I think, would be this: if some one well seen in a great number of tongues, learned as well as vulgar, would handle the various properties of *languages;* showing in what points each excelled, in what it failed. For so not only may languages be enriched by mutual exchanges, but the several beauties of each may be combined (as in the Venus of Apelles) into a most beautiful image and excellent model of speech itself, for the right expressing of the meanings of the mind. And at the same time there will be obtained in this way signs of no slight value but well worthy of observation (which a man would hardly think perhaps) concerning the dispositions and manners of peoples and nations, drawn from their languages. I like well that remark of Cicero's that the Greeks had no word to express the Latin *ineptus;* "because," says he, "that vice was so familiar among the Greeks that they did not perceive

it in themselves;"[1] a censure worthy of the Roman gravity. And how came it that the Greeks used such liberty in composition of words, the Romans on the contrary were so strict and sparing in it? One may plainly collect from this fact that the Greeks were fitter for arts, the Romans for business: for the distinctions of arts are hardly expressed without composition of words; whereas for the transaction of business simpler words are wanted. Then again the Hebrews have such a dislike to these compositions that they had rather abuse a metaphor than introduce a compound word: and the words they use are so few and so little mixed, that one may plainly perceive from their very language that they were a Nazarite nation, separated from the rest of the nations. And is it not a fact worthy of observation (though it may be a little shock to the spirits of us moderns) that the ancient languages were full of declensions, cases, conjugations, tenses, and the like, while the modern are nearly stripped of them, and perform most of their work lazily by prepositions and verbs auxiliary? Surely a man may easily conjecture (how well so ever we think of ourselves) that the wits of the early ages were much acuter and subtler than our own. There are numberless observations of this kind, enough to fill a good volume. And therefore it is not amiss to distinguish Philosophic Grammar from Grammar Simple and Literary, and to set it down as wanting.

To Grammar also I refer all accidents of words, of what kind soever; such as Sound, Measure, Accent. The primary formation of simple letters indeed (that is, by what percussion of the tongue, by what opening

[1] Cicero De Orat. ii. 4.

of the mouth, by what meeting of the lips, by what effort of the throat, the sound of each letter is produced) does not belong to Grammar, but is part of the doctrine concerning Sounds, and to be handled under Sense and the Sensible. The sound which I speak of as belonging to Grammar relates only to sweetnesses and harshnesses. Of these some are common to all nations; for there is no language that does not in some degree shun the hiatus caused by vowels coming together, and the harshnesses caused by consonants coming together. There are others again which are respective, being found pleasing to the ears of some nations and displeasing to others. The Greek language abounds in diphthongs; the Latin is much more sparing of them. The Spanish dislikes thin letters, and changes them immediately into those of a middle tone. Languages derived from the Goths delight in aspirates. Many things of this kind might be mentioned; but these are perhaps more than enough.

The Measure of words has produced a vast body of art; namely Poesy, considered with reference not to the matter of it (of which I have spoken above) but to the style and form of words: that is to say, metre or verse; wherein the art we have is a very small thing, but the examples are large and innumerable. Neither should that art (which the grammarians call Prosody) be confined to the teaching of the kinds and measures of verse. Precepts should be added as to the kinds of verse which best suit each matter or subject. The ancients used hexameter for histories and eulogies; elegiac for complaints; iambic for invectives; lyric for odes and hymns. Nor have modern poets been wanting in this wisdom, so far as their own languages are

concerned. The fault has been, that some of them, out of too much zeal for antiquity, have tried to train the modern languages into the ancient measures (hexameter, elegiac, sapphic, &c.); measures incompatible with the structure of the languages themselves, and no less offensive to the ear. In these things the judgment of the sense is to be preferred to the precepts of art, — as the poet says,

Cœnæ fercula nostræ
Mallem convivis quam placuisse cocis.[1]

And it is not art, but abuse of art, when instead of perfecting nature it perverts her. But for poesy (whether we speak of stories or metre) it is (as I said before) like a luxuriant plant, that comes of the lust of the earth, without any formal seed. Wherefore it spreads everywhere and is scattered far and wide, — so that it would be vain to take thought about the defects of it. With this therefore we need not trouble ourselves. And with regard to Accents of words, it is too small a matter to speak of; unless perhaps it be thought worth remarking, that while the accentuation of *words* has been exquisitely observed, the accentuation of *sentences* has not been observed at all. And yet it is common to all mankind almost to drop the voice at the end of a period, to raise it in asking a question, and other things of the kind not a few. And so much for the part of Grammar which relates to Speech.

As for Writing, it is performed either by the common alphabet (which is used by everybody) or by a secret and private one, agreed upon by particular persons; which they call *ciphers*. And with regard to the

[1] Mart. ix. 83.: —
The dinner is for eating, and my wish is
That guests and not that cooks should like the dishes.

common orthography itself, a controversy and question has been raised among us, — namely, whether words ought to be written as they are pronounced, or in the usual way. But this apparently reformed style of writing (viz. in which the spelling should agree with the pronunciation) belongs to the class of unprofitable subtleties. For the pronunication itself is continually changing; it does not remain fixed; and the derivations of words, especially from foreign tongues, are thereby completely obscured. And as the spelling of words according to the fashion is no check at all upon the fashion of pronunication, but leaves it free, to what purpose is this innovation?

Let us proceed then to Ciphers. Of these there are many kinds: simple ciphers; ciphers mixed with non-significant characters; ciphers containing two different letters in one character; wheel-ciphers; key-ciphers; word-ciphers; and the like. But the virtues required in them are three; that they be easy and not laborious to write; that they be safe, and impossible to be deciphered; and lastly that they be, if possible, such as not to raise suspicion. For if letters fall into the hands of those who have power either over the writers or over those to whom they are addressed, although the cipher itself may be safe and impossible to decipher, yet the matter comes under examination and question; unless the cipher be such as either to raise no suspicion or to elude inquiry. Now for this elusion of inquiry, there is a new and useful contrivance for it, which as I have it by me, why should I set it down among the desiderata, instead of propounding the thing itself? It is this: let a man have two alphabets, one of true letters, the other of non-significants; and let him infold

in them two letters at once; one carrying the secret, the other such a letter as the writer would have been likely to send, and yet without anything dangerous. Then if any one be strictly examined as to the cipher, let him offer the alphabet of non-significants for the true letters, and the alphabet of true letters for non-significants. Thus the examiner will fall upon the exterior letter; which finding probable, he will not suspect anything of another letter within. But for avoiding suspicion altogether, I will add another contrivance, which I devised myself when I was at Paris in my early youth, and which I still think worthy of preservation. For it has the perfection of a cipher, which is to make anything signify anything; subject however to this condition, that the infolding writing shall contain at least five times as many letters as the writing infolded: no other condition or restriction whatever is required. The way to do it is this: First let all the letters of the alphabet be resolved into transpositions of two letters only. For the transposition of two letters through five places will yield thirty-two differences; much more twenty-four, which is the number of letters in our alphabet. Here is an example of such an alphabet.

Example of an Alphabet in two letters.

A	*B*	*C*	*D*	*E*	*F*
Aaaaa.	*aaaab.*	*aaaba.*	*aaabb.*	*aabaa.*	*aabab.*
G	*H*	*I*	*K*	*L*	*M*
aabba.	*aabbb.*	*abaaa.*	*abaab.*	*ababa.*	*ababb.*
N	*O*	*P*	*Q*	*R*	*S*
abbaa.	*abbab.*	*abbba.*	*abbbb.*	*baaaa.*	*baaab.*
T	*V*	*W*	*X*	*Y*	*Z.*
baaba.	*baabb.*	*babaa.*	*babab.*	*babba.*	*babbb.*

Nor is it a slight thing which is thus by the way effected. For hence we see how thoughts may be communicated at any distance of place by means of any objects perceptible either to the eye or ear, provided only that those objects are capable of two differences; as by bells, trumpets, torches, gunshots, and the like. But to proceed with our business: when you prepare to write, you must reduce the interior epistle to this biliteral alphabet. Let the interior epistle be

Fly.

Example of reduction.

F	*L*	*Y.*
aabab.	*ababa.*	*babba.*

Have by you at the same time another alphabet in two *forms;* I mean one in which each of the letters of the common alphabet, both capital and small, is exhibited in two different forms, — any forms that you find convenient.

Example of an Alphabet in two forms.

a	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*
A	*A*	*a*	*a*	*B*	*B*	*b*	*b*	*C*	*C*	*c*	*c*
D	*D*	*d*	*d*	*E*	*E*	*e*	*e*	*F*	*F*	*f*	*f*
G	*G*	*g*	*g*	*H*	*H*	*h*	*h*	*I*	*J*	*i*	*i*
K	*K*	*k*	*k*	*L*	*L*	*l*	*l*	*M*	*M*	*m*	*m*
N	*N*	*n*	*n*	*O*	*O*	*o*	*o*	*P*	*P*	*p*	*p*
Q	*Q*	*q*	*q*	*R*	*R*	*r*	*r*	*S*	*S*	*s*	*s*
T	*T*	*t*	*t*	*U*	*U*	*u*	*u*	*v*	*v*		
W	*W*	*w*	*w*	*X*	*X*	*x*	*x*	*Y*	*Y*	*y*	*y*
				Z	*Z*	*z*	*z*				

Then take your interior epistle, reduced to the bi-

literal shape, and adapt to it letter by letter your exterior epistle in the biform character; and then write it out. Let the exterior epistle be

Do not go till I come.

Example of Adaptation.

F	*L*	*Y.*
aa bab.	*ab aba.b*	*a bba.*
Do not	*go till*	*I come.*

I add another large example of the same cipher, — of the writing of anything by anything.

The interior epistle; for which I have selected the Spartan despatch, formerly sent in the *Scytale.*

All is lost. Mindarus is killed. The soldiers want food. We can neither get hence, nor stay longer here.

The exterior epistle, taken from Cicero's first letter, and containing the Spartan despatch within it.

In all duty or rather piety towards you I satisfy every body except myself. Myself I never satisfy. For so great are the services which you have rendered me, that seeing you did not rest in your endeavours on my behalf till the thing was done, I feel as if life had lost all its sweetness, because I cannot do as much in this cause of yours. The occasions are these: Ammonius the King's ambassador openly besieges us with money: the business is carried on through the same creditors who were employed in it when you were here, &c.

The doctrine of Ciphers carries along with it another doctrine, which is its relative. This is the doctrine of deciphering, or of detecting ciphers, though one be quite ignorant of the alphabet used or the private un-

derstanding between the parties: a thing requiring both labour and ingenuity, and dedicated, as the other likewise is, to the secrets of princes. By skilful precaution indeed it may be made useless; though as things are it is of very great use. For if good and safe ciphers were introduced, there are very many of them which altogether elude and exclude the decipherer, and yet are sufficiently convenient and ready to read and write. But such is the rawness and unskilfulness of secretaries and clerks in the courts of kings, that the greatest matters are commonly trusted to weak and futile ciphers.

It may be suspected perhaps that in this enumeration and *census*, as I may call it, of arts, my object is to swell the ranks of the sciences thus drawn up on parade, that the numbers of them may raise admiration; whereas in so short a treatise, though the numbers may perhaps be displayed, the force and value of them can hardly be explained. But I am true to my design, and in framing this globe of knowledge I do not choose to omit even the smaller and more remote islands. And though my handling of these things be cursory, it is not (as I think) superficial; but out of a large mass of matter I pick out with a fine point the kernels and marrows of them. Of this however I leave those to judge who are most skilful in such arts. For whereas most of those who desire to be thought multiscient are given to parade the terms and externals of arts, thereby making themselves the admiration of those who do not understand those arts and the scorn of those who do; I hope that my labours will have the contrary fate, and arrest the judgment of those most who are most skilful in the several arts, and

be less cared for by the rest. As for those arts which may appear to be of a lower order, if any one thinks that I make somewhat too much of them, let him look round, and he will see that men who are great and famous in their own counties, when they come up to the metropolis and seat of empire are almost lost in the crowd, and of no mark; and in like manner it is not strange that these lighter arts when placed by the side of the principal and superior ones appear of less dignity; although to such as have spent their chief study upon them they seem great and illustrious things. And so much for the Organ of Discourse.

CHAP. II.

The doctrine of the Method of Discourse *is made a substantive and principal part of the art of transmitting; and is named* Wisdom of Transmission. *Different kinds of Method are enumerated, with a note of their advantages and disadvantages.*

Let us now come to the doctrine concerning the Method of Discourse. This has been commonly handled as a part of Logic; and it also finds a place in Rhetoric, under the name of *Disposition*. But the placing of it in the train of other arts has led to the passing over of many things relating to it which it is useful to know. I have therefore thought fit to make the doctrine concerning Method a substantive and principal doctrine, under the general name of *Wisdom of Transmission*. The kinds of method being various, I will begin by enumerating rather than distributing

them. And first, for the "one and only method," with its distribution of everything into two members, it is needless to speak of it; for it was a kind of cloud that overshadowed knowledge for awhile and blew over: a thing no doubt both very weak in itself and very injurious to the sciences. For while these men press matters by the laws of their method, and when a thing does not aptly fall into those dichotomies, either pass it by or force it out of its natural shape, the effect of their proceeding is this, — the kernels and grains of the sciences leap out, and they are left with nothing in their grasp but the dry and barren husks. And therefore this kind of method produces empty abridgments, and destroys the solid substance of knowledge.

Let the first difference of Method then be this: it is either *Magistral* or *Initiative*. Observe however that in using the word "initiative," I do not mean that the business of the latter is to transmit the beginnings only of sciences, of the former to transmit the entire doctrine. On the contrary I call that doctrine *initiative* (borrowing the term from the sacred ceremonies) which discloses and lays bare the very mysteries of the sciences. The magistral method teaches; the initiative intimates. The magistral requires that what is told should be believed; the initiative that it should be examined. The one transmits knowledge to the crowd of learners; the other to the sons, as it were, of science. The end of the one is the use of knowledges, as they now are; of the other the continuation and further progression of them. Of these methods the latter seems to be like a road abandoned and stopped up; for as knowledges have hitherto been delivered, there is a kind of contract of error between the de-

liverer and the receiver; for he who delivers knowledge desires to deliver it in such form as may be best believed, and not as may be most conveniently examined; and he who receives knowledge desires present satisfaction, without waiting for due inquiry; and so rather not to doubt, than not to err; glory making the deliverer careful not to lay open his weakness, and sloth making the receiver unwilling to try his strength. But knowledge that is delivered to others as a thread to be spun on ought to be insinuated (if it were possible) in the same method wherein it was originally invented. And this indeed is possible in knowledge gained by induction; but in this same anticipated and premature knowledge (which is in use) a man cannot easily say how he came to the knowledge which he has obtained. Yet certainly it is possible for a man in a greater or less degree to revisit his own knowledge, and trace over again the footsteps both of his cognition and consent; and by that means to transplant it into another mind just as it grew in his own. For it is in knowledges as it is in plants; if you mean to use the plant, it is no matter what you do with the root; but if you mean to remove it to grow, then it is safer to use roots than slips. So the method of transmitting knowledge which is now in use presents trunks as it were of sciences (and fair ones too), but without the roots; good for the carpenter, but useless for the planter. But if you will have sciences grow, you need not much care about the body of the tree; only look well to this, that the roots be taken up uninjured, and with a little earth adhering to them. Of which kind of transmission the method of the mathematicians has, in that subject, some shadow; but generally I do

not see it either put in use or inquired of. Therefore I note it as deficient, and term it the *Handing on of the Lamp*, or Method of Delivery to Posterity.

Another diversity of Method there is, which in intention has an affinity with the former, but is in reality almost contrary. For both methods agree in aiming to separate the vulgar among the auditors from the select; but then they are opposed in this, that the former makes use of a way of delivery more open than the common, the latter (of which I am now going to speak) of one more secret. Let the one then be distinguished as the *Exoteric* method, the other as the *Acroamatic;* a distinction observed by the ancients principally in the publication of books, but which I transfer to the method of delivery. Indeed this acroamatic or enigmatical method was itself used among the ancients, and employed with judgment and discretion. But in later times it has been disgraced by many, who have made it as a false and deceitful light to put forward their counterfeit merchandise. The intention of it however seems to be by obscurity of delivery to exclude the vulgar (that is the profane vulgar) from the secrets of knowledges, and to admit those only who have either received the interpretation of the enigmas through the hands of the teachers, or have wits of such sharpness and discernment as can pierce the veil.

Next comes another diversity of Method, of great consequence to science; which is the delivery of knowledge in *aphorisms*, or in *methods*. For it is specially to be noted, that it has become the fashion to make, out of a few axioms and observations upon any subject, a kind of complete and formal art, filling it up with some discourses, illustrating it with examples, and

digesting it into method. But that other delivery by aphorisms has many excellent virtues whereto the methodical delivery does not attain. First it tries the writer, whether he be light and superficial in his knowledge, or solid. For aphorisms, not to be ridiculous, must be made out of the pith and heart of sciences. For illustration and excursion are cut off; variety of examples is cut off; deduction and connexion are cut off: descriptions of practice are cut off; so there is nothing left to make the aphorisms of but some good quantity of observation. And therefore a man will not be equal to the writing in aphorisms, nor indeed will he think of doing so, unless he feel that he is amply and solidly furnished for the work. But in methods,

> —— Tantum series juncturaque pollet,
> Tantum de medio sumptis accedit honoris,[1]

that those things many times carry a show of I know not what excellent art, which if they were taken to pieces, separated, and stripped, would shrink to little or nothing. Secondly, methodical delivery is fit to win consent or belief, but of little use to give directions for practice; for it carries a kind of demonstration in circle, one part illuminating another, and therefore more satisfies the understanding; but as actions in common life are dispersed, and not arranged in order, dispersed directions do best for them. Lastly, aphorisms, representing only portions and as it were fragments of knowledge, invite others to contribute and add something in their turn; whereas methodical delivery, carrying the show of a total, makes men careless, as if they were already at the end.

[1] Hor. Ep. ad Pisones, 242.:—
The order and the joining give such graces,
Mean matters take such honour from their places.

Next comes another diversity of Method, which is likewise of great weight; namely the delivery of knowledge by *assertions with proofs*, or by *questions with determinations;* the latter kind whereof, if it be immoderately followed, is as prejudicial to the advancement of learning, as it is detrimental to the fortunes and progress of an army to go about to besiege every little fort or hold. For if the field be kept, and the sum of the enterprise pursued, those smaller things will come in of themselves; although it is true that to leave a great and fortified town in the rear would not be always safe. In like manner in the transmission of knowledge confutations should be refrained from; and only employed to remove strong preoccupations and prejudgments, and not to excite and provoke the lighter kind of doubts.

Next comes another diversity of Method, namely that the *method used should be according to the subject-matter which is handled.* For there is one method of delivery in the mathematics (which are the most abstracted and simple of knowledges), another in politics (which are the most immersed and compounded). And (as I have already said) uniformity of method is not compatible with multiformity of matter. Wherefore as I approved of Particular Topics for invention, so to a certain extent I allow likewise of Particular Methods for transmission.

Next comes another diversity of Method, which in the delivery of knowledge is to be used with discretion. This is regulated according to the informations and anticipations already infused and impressed on the minds of the learners concerning the knowledge which is to be delivered. For that knowledge which comes

altogether new and strange to men's minds is to be delivered in another form than that which is akin and familiar to opinions already taken in and received. And therefore Aristotle, when he thinks to tax Democritus, does in truth commend him, where he says, "If we shall indeed dispute, and not follow after similitudes,"[1] &c.; thus making it a charge against Democritus, that he was too fond of comparisons. For those whose conceits are already seated in popular opinions, need but to dispute and prove; whereas those whose conceits are beyond popular opinions, have a double labour; first to make them understood, and then to prove them; so that they are obliged to have recourse to similitudes and metaphors to convey their meaning. We see therefore in the infancy of learning, and in rude times, when these conceits which are now old and trivial were new and unheard of, that the world was full of parables and similitudes. For else would men either have passed over without due mark or attention, or else rejected as paradoxical, that which was laid before them. For it is a rule in the art of transmission, that all knowledge which is not agreeable to anticipations or presuppositions must seek assistance from similitudes and comparisons.

And so much for the diversities of Method, which have not hitherto been pointed out by others. For as for those other methods, — Analytic, Systatic, Diæretic, also Cryptic, Homeric, and the like, — they are rightly invented and distributed, and I see no reason why I should dwell upon them.

Such then are the kinds of Method. Its parts are two; the one relating to the disposition of the whole

[1] Arist. Nic. Eth. vi. 3.

work or argument of a book; the other to the limitation of propositions. For there belongs to architecture not only the frame of the whole building, but also the formation and shape of the several beams and columns thereof; and Method is as it were the architecture of the sciences. And herein Ramus merited better in reviving those excellent rules of propositions (that they should be true, universally, primarily, and essentially[1]), than he did in introducing his uniform method and dichotomies; and yet it comes ever to pass, I know not how, that in human affairs (according to the common fiction of the poets) "the most precious things have the most pernicious keepers." Certainly the attempt of Ramus to amend propositions drove him upon those epitomes and shallows of knowledge. For he must have a lucky and a happy genius to guide him who shall attempt to make the axioms of sciences convertible, and shall not withal make them circular, or returning into themselves. Nevertheless I must confess that the intention of Ramus in this was excellent.

There still remain two limitations of propositions, besides that for making them convertible; the one regarding their extension, the other their production. Certainly sciences, if a man rightly observe it, have, besides profundity, two other dimensions, namely latitude and longitude. The profundity relates to their truth and reality; for it is they which give solidity. As to the other two, the latitude may be accounted and computed from one science to another; the longitude from the highest proposition to the lowest in the same science. The one contains the true bounds and limits of sciences, that the propositions thereof may be handled properly,

[1] Καθόλου πρῶτον, κατὰ παντὸς, καθ' αὑτό, &c.

not promiscuously, and repetition, excursion, and all confusion may be avoided; the other prescribes the rule how far and to what degree of particularity the propositions of a science should be deduced. For certainly something must be left to exercise and practice; since we should avoid the error of Antoninus Pius and not be "splitters of cummin seeds" in the sciences, nor multiply divisions to extreme minuteness. Therefore it is plainly worth inquiry how we are to guide ourselves in this matter. For we see that too remote generalities (unless they be deduced) give little information, and do but offer knowledge to the scorn of practical men; being of no more avail for practice, than an Ortelius's universal map is to direct the way between London and York. Certainly the best sort of rules are not unfitly compared to mirrors of steel, where you may see the images of things, but not before they are polished; so rules and precepts will help if they be laboured and polished by practice, but not otherwise. But if these rules could be made clear and crystalline from the first, it were best; because there would then be less need of continual labour and practice. And so much for the science of method, which I have called the Wisdom of Transmission.

And yet I must not omit to mention, that some persons more ostentatious than learned have laboured about a kind of method not worthy to be called a legitimate method, being rather a method of imposture, which nevertheless would no doubt be very acceptable to certain meddling wits. The object of it is to sprinkle little drops of a science about, in such a manner that any sciolist may make some show and ostentation of learning. Such was the Art of Lullius: such

the Typocosmy traced out by some; being nothing but a mass and heap of the terms of all arts, to the end that they who are ready with the terms may be thought to understand the arts themselves. Such collections are like a fripper's or broker's shop, that has ends of everything, but nothing of worth.

CHAP. III.

Of the foundations and office of Rhetoric. Three appendices of Rhetoric, which relate only to the Promptuary; Colours of Good and Evil, *both Simple and Comparative;* Antitheses of Things; Lesser Forms of Speeches.

I NOW come to the doctrine concerning the Illustration of Discourse. This is that which is called Rhetoric, or Oratory; a science certainly both excellent in itself, and excellently well laboured. Truly valued indeed, eloquence is doubtless inferior to wisdom. For what a distance there is between them is shown in the words spoken by God to Moses, when he declined the office assigned him on the ground that he was no speaker; "There is Aaron, he shall be thy speaker, thou shalt be to him as God." [1] Yet in profit and in popular estimation wisdom yields to eloquence; for so Solomon says; "The wise in heart shall be called prudent, but he that is sweet of speech shall compass greater things;" [2] plainly signifying that wisdom will help a man to a name or admiration, but that it is eloquence which prevails most in action and common life.

[1] Exod. iv. 16. [2] Prov. xvi. 21.

But as to the labouring of this art, the emulation of Aristotle with the rhetoricians of his time, and the eager and vehement zeal of Cicero doing his utmost to ennoble it, coupled with his long experience, has made them in their works on rhetoric exceed themselves. Again those most brilliant examples of the art which we have in the orations of Demosthenes and Cicero, added to the perfection and skill of the precepts, have doubled the progression in it. And therefore the deficiencies which I shall note will rather be in some collections which may as handmaids attend the art, than in the rules and use of the art itself. For when in treating of Logic I made mention of a certain Promptuary or Preparatory Store, I promised to produce fuller examples of it in Rhetoric.

Notwithstanding, to open and stir the earth a little, according to my custom, about the roots of this science; Rhetoric is subservient to the imagination, as Logic is to the understanding; and the duty and office of Rhetoric, if it be deeply looked into, is no other than to apply and recommend the dictates of reason to imagination, in order to excite the appetite and will. For we see that the government of reason is assailed and disordered in three ways; either by the illaqueation of sophisms, which pertains to Logic; or by juggleries of words, which pertain to Rhetoric; or by the violence of the Passions, which pertains to Ethics. For as in negotiations with others, men are usually wrought either by cunning, or by importunity, or by vehemency; so likewise in this negotiation within ourselves, we are either undermined by fallacies of arguments, or solicited and importuned by assiduity of impressions and observations, or agitated and transported

by violence of passions. And yet the nature of man is not so unfortunately built, as that those arts and faculties should have power to disturb reason, and no power to strengthen or establish it; on the contrary they are of much more use that way. For the end of logic is to teach a form of argument to secure reason, and not to entrap it; the end likewise of moral philosophy is to procure the affections to fight on the side of reason, and not to invade it; the end of rhetoric is to fill the imagination with observations and images, to second reason, and not to oppress it. For abuses of arts only come in indirectly, as things to guard against, not as things to practise.

And therefore it was great injustice in Plato (though springing out of a just hatred of the rhetoricians of his time) to place rhetoric among arts voluptuary; resembling it to cookery, which did as much to spoil wholesome meats, as by variety and delicacy of sauces to make unwholesome meats more palatable.[1] But God forbid that speech should not be much more conversant in adorning that which is good, than in colouring that which is evil; for this is a thing in use everywhere; there being no man but speaks more honestly than he thinks or acts. And it was excellently noted by Thucydides as a censure passed upon Cleon, that because he used always to hold on the bad side, therefore he was ever inveighing against eloquence and grace of speech; as well knowing that no man can speak fair of courses sordid and base; while it is easy to do it of courses just and honourable.[2] For Plato said elegantly (though it has now grown into a common-place) "that virtue, if she could be seen, would

[1] Cf. Plato, Gorgias, p. 462, &c.

[2] Cf. Thucyd. iii. 42.

move great love and affection;"[1] and it is the business of rhetoric to make pictures of virtue and goodness, so that they may be seen. For since they cannot be showed to the sense in corporeal shape, the next degree is to show them to the imagination in as lively representation as possible, by ornament of words. For the method of the Stoics, who thought to thrust virtue upon men by concise and sharp maxims and conclusions, which have little sympathy with the imagination and will of man, has been justly ridiculed by Cicero.[2]

Again, if the affections themselves were brought to order, and pliant and obedient to reason, it is true there would be no great use of persuasions and insinuations to give access to the mind, but naked and simple propositions and proofs would be enough. But the affections do on the contrary make such secessions and raise such mutinies and seditions (according to the saying,

—— Video meliora proboque,
Deteriora sequor)[3]

that reason would become captive and servile, if eloquence of persuasions did not win the imagination from the affections' part, and contract a confederacy between the reason and imagination against them. For it must be observed that the affections themselves carry ever an appetite to apparent good, and have this in common with reason; but the difference is that affection beholds principally the good which is present; reason looks beyond and beholds likewise the future and sum of all. And therefore the present filling the imagination more,

[1] Cf. Plato, Phædrus, p. 250. [2] Cicero, De Fin. iv. 18 and 19.
[3] Ovid, Metam. vii. 20.: —

The better course I know and well approve;
The worse I follow.

reason is commonly vanquished and overcome. But after eloquence and force of persuasion have made things future and remote appear as present, then upon the revolt of imagination to reason, reason prevails.

Let us conclude therefore that rhetoric can be no more blamed for knowing how to colour the worse side, than logic for teaching how to make fine sophisms. For who does not know that the principle of contraries is the same, though the use be opposite? It appears also that logic differs from rhetoric not only (as is commonly said) in that the one is like the fist, and the other like the open hand (that is the one close, the other at large[1]); but much more in this, that logic handles reason in truth and nature, and rhetoric handles it as it is planted in the opinions of the vulgar. And therefore Aristotle wisely places rhetoric between logic on the one side, and moral and civil knowledge on the other, as participating of both.[2] For the proofs and demonstrations of logic are the same to all men; but the proofs and persuasions of rhetoric ought to differ according to the auditors; so that like a musician accommodating his skill to different ears, a man should be

Orpheus in silvis, inter delphinas Arion;[3]

which application and variety of speech, in perfection of idea, ought to extend so far, that if a man should speak of the same thing to several persons, he should nevertheless use different words to each of them; though this politic and familiar part of eloquence in private discourse it is certain that the greatest orators

[1] Cf. Cicero, De Fin. ii. 17.

[2] Arist. Rhet. i. 2.

[3] Virg. Ecl. viii. 56.: —

Orpheus by land the trees about him bringing,
By sea, Arion borne to the dolphins singing.

commonly want; while in observing their well graced forms of speech, they lose that volubility of application, and those characters of style, which it would be better to use in addressing different individuals. And therefore it will not be amiss to recommend this of which I now speak to fresh inquiry, and calling it by the name of *The Wisdom of Private Discourse* to set it down among the deficients; being a thing which the more it is considered the more it will be valued. But whether it be placed in rhetoric or in policy, is a matter of little moment.

Let us now descend to the deficiencies in this art, which (as I said before) are rather as appendices than parts of the art itself, and all belong to the Promptuary. First therefore I do not find the wisdom and diligence of Aristotle well pursued and supplied. For he began to make a collection of *the popular signs* or *colours of apparent good and evil*, both simple, and comparative; which are really the sophisms of rhetoric. Now these are of excellent use, especially for business and the wisdom of private discourse. But the labours of Aristotle[1] regarding these colours are in three points defective; one, that he recounts a few only out of many; another, that he does not add the answers to them; and the third, that he seems to have conceived but a part of the use of them. For their use is not more for probation than for affecting and moving. For there are many forms which, though they mean the same, yet affect differently; as the difference is great in the piercing of that which is sharp and that which is flat, though the strength of the percussion be the same. Certainly there is no man who will not be

[1] Arist. Rhetoric, i. 6 and 7.

more affected by hearing it said, "Your enemies will be glad of this,"

Hoc Ithacus velit, et magno mercentur Atridæ,[1]

than by hearing it said only, "This will be evil for you." Therefore these points and stings of words are by no means to be neglected. But as I set this down as deficient, I will according to my custom support it by examples; for precepts would not give a sufficient illustration of the thing.

Examples *of the Colours of Good and Evil, both Simple and Comparative.*

SOPHISM.

1. *What men praise and honour is good; what they dispraise and condemn is evil.*

ANSWER.

This Sophism deceives in four ways; by reason of ignorance, of bad faith, of party spirit and factions, of the natural dispositions of those who praise and blame. By reason of ignorance; for what is popular judgment worth as a test of good and evil? Better was Phocion's inference, who when the people applauded him more than usual, asked whether he had done wrong.[2] By reason of bad faith, because in praising and blaming, men are commonly thinking of their own business, and not speaking what they think.

Laudat venales, qui vult extrudere, merces.[3]

[1] Virg. Æn. ii. 104.: —

This would Ulysses wish, and Atreus' sons
Give much to hear of.

[2] Phocion, c. 8.

[3] 11.: — The merchant praises what he wants to sell.

And again; "It is naught, it is naught (says the buyer); but when he is gone his way, he will vaunt."[1] By reason of factions; for any man may see that men are wont to exalt those of their own party with immoderate praises, and depress below their desert those of the contrary. By reason of natural disposition; for some men are by nature formed and composed for servile adulation, while others on the contrary are crabbed and captious; so that in praising and blaming they do but gratify their own dispositions, with little regard to truth.

Sophism.

2. *What is praised even by enemies, is a great good; but what is reproved even by friends, is a great evil.*

This Sophism appears to rest on the ground that that which we speak unwillingly and against our wish and inclination may be supposed to be wrung from us by the force of truth.

Answer.

This Sophism deceives by reason of the cunning as well of enemies as of friends. For enemies sometimes bestow praise, not against their will, nor as being compelled thereto by the force of truth, but choosing such points for praise as may breed envy and dangers to the subjects of it. And hence there was a prevailing superstition amongst the Greeks, that when a man was praised by another with a malicious purpose to injure him, a pimple would grow upon his nose. It deceives likewise, because enemies sometimes bestow praises merely by way of preface, that they may afterwards calumniate more freely and maliciously. On the other

[1] Proverbs, xx. 14.

hand, this Sophism deceives also by reason of the cunning of friends. For they too are wont sometimes to acknowledge and proclaim the faults of their friends, not because truth compels them, but choosing such faults as may do them least injury; as if in other respects they were excellent men. It deceives again, because friends also use reprehensions (as I have said that enemies bestow praises) by way of prefaces, whereby they may presently be the more large in commendation.

SOPHISM.

3. *That which it is good to be deprived of, is in itself an evil; that which it is bad to be deprived of, is in itself a good.*

ANSWER.

This Sophism deceives in two ways; by reason either of the comparative degrees of good and evil, or of the succession of good to good, or evil to evil. By reason of comparison: if it was for the good of mankind to be deprived of acorns as food, it does not follow that that food was bad; acorns were good, but corn is better. Nor if it was bad for the Syracusans to be deprived of the elder Dionysius, does it follow that he was good, but that he was not so bad as Dionysius the younger. By reason of succession: — for when a good thing is taken away it is not always succeeded by a bad thing, but sometimes by a greater good; as when the flower falls and the fruit succeeds. Neither when a bad thing is taken away is it always succeeded by a good thing, but sometimes by a worse. For by the removal of his enemy Clodius, Milo lost the "seed bed of his glory."[1]

[1] Cicero, Pro Mil. 36.

Sophism.

4. *That which approaches to good or evil, is itself good or evil; but that which is remote from good is evil, that from evil, good.*

It is commonly found that things which agree in nature are placed together, and that things of a contrary nature are placed apart; for everything delights to associate with itself that which is agreeable, and to repel that which is disagreeable.

Answer.

But this Sophism deceives in three ways; by reason, 1st of destitution, 2ndly of obscuration, and 3dly of protection. By reason of destitution; for it happens that those things which are most abundant and excellent in their own kind attract everything as far as may be to themselves, spoiling and as it were starving all things in their neighbourhood. Thus you will never find flourishing underwood near great trees. And rightly was it said "that the servants of a rich man are the greatest slaves." So also the lower order of courtiers were pleasantly compared to the vigils of festivals, that are next the feast days, but are themselves devoted to fasting. By reason of obscuration; for all things that are excellent in their own kind have this, — that though they do not impoverish and starve the things next to them, yet they obscure and overshadow them; as astronomers remark of the sun, that it is good in aspect, but evil in conjunction and approximation. By reason of protection; for it is not only for consort and similarity of nature that things unite and collect together; but evil also (especially in civil matters)

betakes itself to good for concealment and protection. And hence malefactors seek the protection of sanctuaries, and vice itself resorts to the shadow of virtue;

Sæpe latet vitium proximitate boni.[1]

So on the other hand good draws near to evil, not for company, but to convert and reform it. And therefore physicians attend more on the sick than the healthy; and it was objected to our Saviour that he conversed with publicans and sinners.

Sophism.

5. *That to which the other parties or sects agree in giving the second place (each putting itself first) seems to be the best; for it seems that in taking the first place they are moved by zeal and partiality, but in bestowing the second by truth and merit.*

So Cicero argues that the sect of the Academics, which maintained the impossibility of comprehending truth, was the best of the philosophies. "For (said he) ask a Stoic which is the best philosophy, and he will prefer his own to the rest; then ask him which is the next best, and he will acknowledge the Academic. So again the Epicurean (who will hardly deign to look at a Stoic), after he has placed his own philosophy at the head, will place the Academic next."[2] In like manner, when a place is vacant, if the prince were to ask each candidate whom he would most recommend next to himself, it is probable that their second votes would meet in the most able and deserving man.

[1] Ovid, De Art. Amand. ii. 262.: —

Vice often lurks 'neath Virtue's shade.

[2] Cf. the fragment of the *Academ. ad Varr.* preserved by St. Augustine.

ANSWER.

This Sophism deceives by reason of envy. For next to themselves and their own party, men generally incline to those who are weakest and least formidable, and have given them least trouble; in despite of those who have most insulted or inconvenienced them.

SOPHISM.

6. *That which is better in perfection, is better altogether.*

To this belong the common forms; "Let us not wander in generalities," "Let us compare particular with particular," &c.

ANSWER.

This Sophism appears forcible enough, and rather logical than rhetorical; but still it is sometimes deceptive. First, because there are not a few things which are very much exposed to danger, yet if they escape prove excellent; so that in kind they are inferior, as being oftener imperilled and lost, but individually they are more noble. Of this kind is a blossom in March, whereof the French proverb says; "A March blossom, and a Paris child, if one of them survive, it is worth ten others."[1] So that generally the blossom of May is superior to the blossom of March; but yet individually the best blossom of March is preferred to the best of May. It deceives secondly, by reason of the nature of things being more equal in some kinds or species, and more unequal in others; as it has been

[1] Bourgeon de Mars, enfant de Paris,
Si un eschape, il en vaut dix.

remarked that in general the hotter climates produce the sharper wits; but then the best wits of the colder climates surpass the sharpest of the hotter. So again in many armies if the matter were tried by duel between two champions, the victory would go on the one side, if by the whole army, on the other. For excellencies and superiorities are casual; whereas kinds are governed by nature or discipline. In kind again, metal is more precious than stone; but yet a diamond is more precious than gold.

Sophism.

7. *That which keeps the matter open, is good; that which leaves no opening for retreat, is bad. For not to be able to retreat is to be in a way powerless; and power is a good.*

Hence Æsop derived the fable of the two frogs, who in a great drought, when water was everywhere failing, consulted together what was to be done. The first said, "Let us leap down into a deep well, since it is not likely that the water will fail there." But the other rejoined, "Yes, but if it chance that the water fail there also, how shall we be able to get up again?" And the ground of this Sophism is, that human actions are so uncertain and subject to such risks, that that appears the best course which has the most passages out of it. To this belong those forms which are in use,—"You will tie your hands and engage yourself," "You will not be free to take what fortune may offer," &c.

Answer.

This Sophism deceives, first because in human actions fortune insists that some resolution shall be taken.

For, as it was prettily said by some one, "not to resolve is itself to resolve;" so that many times suspension of resolution involves us in more necessities than a resolution would. And it seems to be the same disease of mind which is found in misers, only transferred from the desire of keeping money to the desire of keeping freedom of will and power. For as the miser will enjoy nothing, because he will not diminish his store, so this kind of sceptic will execute nothing, because he will still keep all in his own hands. It deceives secondly, because necessity, and the casting of the die (as they call it), is a spur to the courage; as one says, "Being a match for them in the rest, your necessity makes you superior."[1]

Sophism.

8. *The evil which a man brings on himself by his own fault is greater; that which is brought on him by external causes, is less.*

The reason of this is that the sting of conscience doubles adversity, while on the other hand the being conscious that a man is clear and free from fault affords great consolation in calamity. And therefore the poets most exaggerate those sufferings, as coming near to despair, where a man accuses and torments himself;

Seque unum clamat, causamque caputque malorum.[2]

On the other hand the calamities of worthy persons are lightened and tempered by the consciousness of innocence and merit. Besides when the evil is inflicted by others, a man has something that he may

[1] Livy, iv. 28.

[2] Virg. Æn. xii. 600.: — And on herself cries out, as cause of all.

freely complain of, whereby his griefs evaporate and do not suffocate the heart. For in things which come from human injury, we are wont to feel indignation, or to meditate revenge, or to implore, or if not to implore yet to expect, providential retribution; and even if the blow come from fortune, yet is there left a kind of expostulation with the fates themselves;

Atque Deos, atque astra vocat crudelia mater.[1]

Whereas if the evil be derived from a man's own fault, the stings of pain strike inward, and more wound and lacerate the heart.

ANSWER.

This Sophism deceives, first by reason of hope, the great antidote of evils. For amendment of a fault is often in our power, but amendment of fortune is not. Hence Demosthenes more than once addressed his countrymen in words like these: "That which, having regard to the time past, is the worst point and circumstance of all the rest, that as to the time to come is the best. What is that? Even this; that it is your own sloth, irresolution, and misgovernment that have brought your affairs into this ill condition. For had you ordered your means and forces to the best and done your parts every way to the full, and notwithstanding your matters had gone backwards as they do, there had been no hope left of recovery or reparation. But since it has been brought about chiefly by your own errors, you may fairly trust that by amending them you will recover your former condition."[2] So Epictetus discoursing on the degrees of mental tran-

[1] Virg. Eclog. v. 23.: — And she upbraids the gods and cruel stars.
[2] Cf. Demosth. Philipp. i. and iii.

quillity, puts those lowest who accuse others, next those who accuse themselves, and highest of all those who accuse neither others nor themselves.[1] It deceives secondly, by reason of the innate pride of men's minds, which makes them unwilling to acknowledge their own errors. This to avoid, they exercise far more patience in bearing those ills which they have brought on themselves by their own fault. For as we see that when a fault is committed and it is not yet known who is to blame, men are exceeding angry and make much ado about it; but if afterwards it come out that it was done by a son or a wife or a favourite, all is at once hushed and no more noise made; so it is when anything happens for which we must needs take the blame upon ourselves; as we see it very often in women, that if they have done anything against the wishes of their parents and friends, and it turn out ill, whatever misfortune follows they will keep it to themselves and set a good face upon it.

SOPHISM.

9. *From something to nothing appears a greater step than from more to less; and again from nothing to something appears a greater step than from less to more.*

It is a rule in mathematics that there is no proportion between nothing and something; and therefore the degrees of nullity and quiddity appear greater than the degrees of increase and decrease. Thus the loss of an eye is harder for a man with only one eye than for a man with two. In like manner if a man has several children, it is more grief to him to lose the last surviving son than all the rest. Hence also the Sibyl, when she had burned her two first books, doubled the

[1] Epict. Enchirid. c. 5.

price of the third; for the loss of this would have been a degree of privation, and not of diminution.

ANSWER.

This Sophism deceives, first in respect of those things whereof the use consists in a sufficiency or competency, that is in a determinate quantity. For if a man were bound by penalty to pay a certain sum of money on a stated day, it would be worse for him to be one pound short, than (supposing that that one could not be got) to be short by ten pounds more. So in the wasting of fortunes, the degree of debt which makes the first inroad on the capital seems worse than the last which reduces to beggary. To this belong the common forms; "Sparing comes too late when all is gone;"[1] "as good never a whit as never the better," &c. It deceives secondly, in respect of that principle of nature, that the decay of one thing is the generation of another;[2] so that the degree of extreme privation is sometimes of less disadvantage, because it gives a handle and stimulus to some new course. Hence also Demosthenes often complains to his countrymen; "That the terms which they accepted from Philip, not being profitable nor honourable, were nothing else than aliments of their sloth and indolence; which they would be much better without; because then their industry might be better excited to seek other remedies."[3] I knew a physician that when delicate women complained that they were ill and yet could not endure to take any medicine, would say to them, not less wittily than sharply, "Your only way is to be worse, for then you will be glad of any medicine." Moreover

[1] Cf. Erasm. Adag. ii. 2. 64.; and Hesiod. Op. et Dies, 339.
[2] Arist. De Gen. et Corr. i. 4.
[3] Olynth. iii. 33.

this degree of privation or extreme want may be useful not only to stimulate energy, but also to enforce patience.

With regard to the second part of this Sophism, it rests on the same foundation as the former (that is on the degrees of nullity and quiddity). Hence the making of a beginning of anything is thought so great a matter;

Dimidium facti, qui bene cœpit, habet, &c.[1]

Hence also the superstition of astrologers, who make a judgment of the disposition and fortune of a man from the point or moment of his nativity or conception.

ANSWER.

This Sophism deceives, first because in some cases the first beginnings of things are no more than what Epicurus in his philosophy calls *tentamenta*,[2] that is imperfect offers and essays, which are nothing unless they be repeated or proceeded with. Therefore in this case the second degree seems more worthy and more powerful than the first, as the wheel-horse in a cart does more work than the leader. Again, it is not a bad saying "that it is the second word which makes the fray." For perhaps the first would have passed. And so the one made a beginning of the mischief, but the other prevented it from coming to an end. It deceives secondly, by reason of the dignity of perseverance; which lies in the progress, not in the first attempt. For chance or nature may give the first impulse, but only a settled affection and judgment can give constancy. It deceives thirdly, in those things

[1] Hor. Ep. i. 2. 40.: — Well begun is half done.
[2] Cf. Lucretius, v. 835.

whereof the nature and ordinary course goes against the beginning made; so that the first start is ever being frustrated unless the force be kept up; according to the common forms; "Not to advance, is to retreat;" "He who is not gaining, is losing;" as in running up hill, and rowing against stream. But on the other hand, if the motion be down hill, or the rowing be down stream, then the degree of inception is of far greater importance. Besides, this colour extends not only to the degree of inception, which proceeds from power to act, compared with the degree from act to increase; but also to the degree from impotency to power, compared with the degree from power to act. For the degree from impotency to power seems greater than from power to act.

Sophism.

10. *That which has relation to truth is greater than that which has relation to opinion; and the proof that a thing has relation to opinion is this: it is that which a man would not do if he thought it would not be known.*

So the Epicureans say of the Stoics' Felicity placed in virtue, that it is like the felicity of a player, who if he were left of his auditory and their applause, would straight be out of heart and countenance. And therefore in derision they call virtue a theatrical good. But it is otherwise in riches, of which it is said,

> Populus me sibilat; at mihi plaudo.[1]

And likewise of pleasure,

> —— Grata sub imo
> Gaudia corde premens, vultu simulante pudorem.[2]

[1] Hor. Sat. i. 1. 66.: — The people hiss me, but I applaud myself.

[2] Theocr. Id. xxvii.: —

> Her face said fie, for shame; but sweet delight
> Possessed her heart in secret.

ANSWER.

The fallacy of this Sophism is somewhat more subtle; though the answer to the example alleged is easy For virtue is not chosen for the sake of popularity; since it is a precept, that a man should above all things reverence himself.[1] So that a good man will be the same in solitude as on the stage; though perhaps his virtue may be somewhat strengthened by praise, as heat is increased by reflexion. This however denies the supposition, and does not refute the fallacy. Now the answer is this. Allow that virtue (especially such as is attended with labours and conflicts) would not be chosen, except for the sake of the glory and fame accompanying it; yet it does not therefore follow that the motive and appetite to virtue is not principally for its own sake; for fame may only be the impulsive cause, or *sine qua non*, and not the efficient or constituent cause. For instance; if there were two horses, and one of them without the spur could do well, but the other with the spur could do much better, the latter should in my judgment bear off the prize and be accounted the better horse. And to say "Tush, the life of this horse is in the spur," would not move any man of sound judgment; for since the ordinary instrument of horsemanship is the spur, and that it is no manner of burden or impediment to the rider, the horse that is quickened with the spur is not therefore to be less valued; nor again is the other that does wonderfully well without the spur to be reckoned on that account the better, but only the finer and daintier. So glory and honour are the spurs of virtue; and

[1] Pythag. Aur. Vers. v. 12.: — *πάντων δὲ μάλιστ' αἰσχύνεο σαυτόν.*

though virtue would somewhat languish without them, yet as they are always at hand to attend virtue, even when not invited, there is no reason why virtue may not be sought for its own sake as well. And thus the proposition that "a thing which is chosen for opinion's sake and not for truth may be known by this — it is what a man would not do if he thought it would not be known," is rightly answered.

Sophism.

11. *That which is gained by our own merit and industry is a greater good; that which is derived from the kindness of others or from the indulgence of fortune a lesser good.*

The reasons of this are, — first, because there is better hope of the future; for in the favours of others or the good winds of fortune there is little certainty; but our own virtue and industry are ever with us; so that after we have obtained some good in this way we have always the same instruments ready to use again; yea, and by habit and success made more effective. Secondly, because for what we get by the favour of other men we are other men's debtors; whereas what we obtain of ourselves carries no obligation with it. Nay, even when divine mercy has bestowed any favour on us, it demands a kind of retribution to the goodness of God, which is distressing to depraved and wicked men; whereas in the former kind, that comes to pass which the prophet speaks of, "Men rejoice and exult, they sacrifice unto their net, and burn incense unto their drag."[1] Thirdly, because what proceeds not by our own merit, carries with it no praise or rep-

[1] Habakkuk, i. 15, 16.

utation; for felicity begets a kind of admiration, but not praise. As Cicero said to Cæsar; "We have enough to admire, we are looking for something to praise."[1] Fourthly, because the things obtained by our own industry are generally achieved by labour and exertion, which have some sweetness in themselves; as Solomon says, "Meat taken in hunting is sweet."

ANSWER.

To these there are four opposing Sophisms, which incline to the contrary side, and may respectively serve as refutations to the former. The first is that felicity seems to be a kind of sign and character of the divine favour; which both creates confidence and alacrity in ourselves, and wins obedience and respect from others. And this felicity extends to casual things, to which virtue hardly aspires; as when Cæsar to encourage the pilot said, "You carry Cæsar and his fortune;"[2] whereas if he had said, "You carry Cæsar and his virtue," it would have been but cold comfort against the dangers of a storm. The second is that the deeds of virtue and industry are imitable and open to others; whereas felicity is inimitable, and a kind of prerogative of the individual man. Hence we generally see that natural things are preferred to artificial, because they admit not of imitation; for whatever is imitable is potentially common. The third is that things which come of felicity appear free gifts, bought without toil; but things gained by our own virtue seem as paid for. Therefore Plutarch said elegantly, in comparing the actions of Timoleon, a man eminently fortunate, with those of his contemporaries Epaminondas and Agesi-

[1] Cicero, Pro Marcello, c. 9.
[2] Plutarch, De Fortunâ Roman. p. 319.

laus, "That they were like the verses of Homer, which, as they excel in other respects, so they seem to flow naturally, and as it were at the inspiration of genius."[1] The fourth is that that which happens contrary to hope and expectation comes more gratefully and with greater pleasure to men's minds; but this cannot be the case with things effected by our own care and exertion.

SOPHISM.

12. *That which consists of many divisible parts is greater than that which consists of few parts and is more one; for all things when viewed part by part appear greater; whence likewise plurality of parts makes a show of magnitude; but it has a greater effect if the parts be without order; for it produces a resemblance to infinity and prevents comprehension.*

The fallacy here is very palpable, even at first sight; for it is not the plurality of parts alone, but the majority of them, which make the total greater. But yet this Sophism often carries away the imagination; yea, and deceives the sense. For to the sight it appears a shorter distance on a dead level, where nothing intervenes to break the view, than when there are trees and buildings or some other mark to divide and measure the space. So again when a great monied man has divided and distributed his chests and bags, he seems to himself richer than he was. So likewise in amplifications, the effect is increased if the whole be divided into many parts and each be handled separately. And if this be done without order and promiscuously, it fills the imagination still more; for confusion gives an impression of multitude; inasmuch as things set forth and laid out in order, both appear more lim-

[1] Plutarch in Timol. c. 36.

ited in themselves, and make it evident that nothing has been omitted; whereas things that are presented confusedly, are not only thought to be numerous in themselves, but leave room for suspicion that there are many more behind.

ANSWER.

This Sophism deceives, first when a man is prepossessed with an opinion that a thing is greater than it really is. For then the distribution thereof will destroy that false opinion, and show it in its true dimensions, without amplification. And therefore if a man be in sickness or pain, the hours will seem longer without a clock or an hour-glass than with it. For if the weariness and pain of disease make time appear longer than it really is, then the computation of time corrects the error, and makes it appear shorter than had been conceived by the false opinion. So again in a dead plain, the contrary to that which I said just now sometimes happens. For though at first the eye represents the distance to the sense as shorter, because it is undivided; yet if that give an impression of a much shorter distance than it is afterwards found to be, the disappointment of that false opinion will make it appear longer than it really is. Therefore if a man have an over great opinion of anything and you wish to make it still greater, you must beware of distributions, but extol it in the whole. The Sophism deceives secondly, when the distribution is distracted and scattered, and does not meet or strike the eye at one glance. Thus if flowers in a garden be divided into many beds, they will give the appearance of a greater number than if they were all growing in one bed, provided that all the

beds can be seen at once; for otherwise the union will have more effect than the scattered distribution. So again men's revenues seem greater when their farms and properties lie near and contiguous; for if they lie scattered they do not so easily come under view. The Sophism deceives thirdly, by reason of the superiority of unity to multitude. For all piecing together of things is a sure sign of poverty in the pieces; where it comes to that,

Et quæ non prosunt singula, multa juvant.[1]

Therefore Mary's was the better part, — "Martha, Martha, thou art busy about many things, one thing sufficeth."[2] Hence the fable in Æsop of the fox and the cat. For the fox boasted how many tricks and shifts he had to escape the hounds; but the cat said she had only one help to rely on; which was the poor faculty of climbing a tree; yet this was a far better protection than all the fox's tricks; whence the proverb, "The fox knows many tricks, but the cat one good one."[3] And in the moral signification of this fable we see the same thing. For the support of a powerful and faithful friend is a surer protection than all manner of plots and tricks.

These then shall suffice for an example. I have by me indeed a great many more Sophisms of the same kind, which I collected in my youth; but without their illustrations and answers, which I have not now the leisure to perfect; and to set forth the naked colours without their illustrations (especially as those above given appear in full dress) does not seem suitable. Be

[1] Ovid. Rem. Amor. 420.: — Things of no good separate, are useful together.

[2] St. Luke, x. 41, 42.

[3] Cf. Erasmus, Adag. i. 5. 18.

it observed in the meantime that this matter, whatever may be thought of it, seems to me of no small value; as that which participates of Primary Philosophy, of Politics, and of Rhetoric. And so much for the Popular Signs or Colours of Apparent Good and Evil, both simple and comparative.

The second Collection, which belongs to the *Promptuary* or Preparatory Store, is that to which Cicero alludes (as I said above in treating of Logic), where he recommends the orator to have commonplaces ready at hand, in which the question is argued and handled on either side: such as "for the letter of the law," "for the intention of the law," &c. But I extend this precept to other cases; applying it not only to the judicial kind of oratory, but also to the deliberative and demonstrative. I would have in short all topics which there is frequent occasion to handle (whether they relate to proofs and refutations, or to persuasions and dissuasions, or to praise and blame) studied and prepared beforehand; and not only so, but the case exaggerated both ways with the utmost force of the wit, and urged unfairly, as it were, and quite beyond the truth. And the best way of making such a collection, with a view to use as well as brevity, would be to contract those commonplaces into certain acute and concise sentences; to be as skeins or bottoms of thread which may be unwinded at large when they are wanted. Some such piece of diligence I find in Seneca, but in hypotheses or cases. A few instances of the thing, having a great many by me, I think fit to propound by way of example. I call them *Antitheses of Things.*

Examples of *Antitheses.*

I. Nobility.

For.	*Against.*
They whose virtue is in the stock cannot be bad even if they would.	Seldom comes nobility from virtue; seldomer virtue from nobility.
Nobility is the laurel with which Time crowns men.	Noblemen have to thank their ancestors for pardon oftener than for advancement.
We reverence antiquity even in dead monuments; how much more in living ones?	New men are commonly so diligent, that noblemen by their side look like statues.
If you regard not nobility of birth, where will be the difference between the offspring of men and brutes?	Noblemen look behind them too often in the course; the mark of a bad runner.
Nobility withdraws virtue from envy, and makes it gracious.	

II. Beauty.

For.	*Against.*
Deformed persons commonly take revenge on nature.	Virtue is like a rich stone, best plain set.
Virtue is nothing but inward beauty; beauty nothing but outward virtue.	As a fair garment on a deformed body, such is beauty in a bad man.
Deformed persons seek to rescue themselves from scorn — by malice.	They that are beautiful and they that are affected by beauty are commonly alike light.

Beauty makes virtues shine, and vices blush.

III. Youth.

For.

First thoughts and young men's counsels have more of divineness.

Old men are wiser for themselves, not so wise for others and for the commonwealth.

Old age, if it could be seen, deforms the mind more than the body.

Old men are afraid of everything, except the Gods.

Against.

Youth is the seedbed of repentance.

There is implanted in youth contempt for the authority of age; so every man must grow wise at his own cost.

The counsels to which Time is not called, Time will not ratify.

In old men the Loves are changed into the Graces.

IV. Health.

For.

The care of health humiliates the mind and makes it the beggar of the body.

A healthy body is the soul's host, a sick body her gaoler.

Nothing forwards the conclusion of business so much as good health; weak health on the contrary takes too many holidays.

Against.

Often to recover health, is often to renew youth.

Ill health is a good excuse for many things; which we are glad to use even when well.

Good health makes too close an alliance between the soul and the body.

Great empires have been governed from bed, great armies commanded from the litter.

V. Wife and Children.

For.

Love of his country begins in a man's own house.

A wife and children are a kind of discipline of humanity; whereas unmarried men are harsh and severe.

To be without wife or children is good for a man only when he wants to run away.

He who begets not children, sacrifices to death.

They that are fortunate in other things are commonly unfortunate in their children; lest men should come too near the condition of Gods.

Against.

He that has wife and children has given hostages to fortune.

Man generates and has children; God creates and produces works.

The eternity of brutes is in offspring; of men, in fame, good deserts, and institutions.

Domestic considerations commonly overthrow public ones.

Some persons have wished for Priam's fortune, who survived all his children.

VI. Riches.

For.

They despise riches who despair of them.

It is envy of riches that has made virtue a goddess.

While philosophers are disputing whether virtue or pleasure be the proper aim of life, do you provide

Against.

Of great riches you may have either the keeping, or the giving away, or the fame; but no use.

Do you not see what feigned prices are set upon little stones and such rarities, only that there may be some use of great riches?

yourself with the instruments of both.

Virtue is turned by riches into a common good.

Other goods have but a provincial command; only riches have a general one.

Many men while they thought to buy everything with their riches, have been first sold themselves.

I cannot call riches better than the baggage of virtue; for they are both necessary to virtue and cumbersome.

Riches are a good handmaid, but the worst mistress.

VII. Honours.

For.

Honours are the suffrages not of tyrants (as they are said to be), but of divine providence.

Honours make both virtues and vices conspicuous; therefore they are a spur to the one and a bridle to the other.

No man can tell how far his virtue will go unless honours give him a fair field.

Virtue, like all things else, moves violently to her place, calmly in her place; now the place of virtue is honour.

Against.

While we seek honours we lose liberty.

Honours commonly give men power over those things wherein the best condition is not to will, the next best not to can.

The rising to honours is laborious, the standing slippery, the descent headlong.

Great persons had need to borrow the opinions of the vulgar, to think themselves happy.

VIII. Empire.

For.

The enjoyment of happiness is a great good; but the power of imparting it to others is a still greater.

Kings are not as men, but as the stars; for they have great influence both on individuals and on the times themselves.

To resist the vice-gerent of God is not treason, but a kind of theomachy.

Against.

How wretched to have nothing to desire, and everything to fear!

Kings are like the heavenly bodies, which have much veneration but no rest.

None of human condition is admitted to the banquets of the Gods unless it be in derision.

IX. Praise, Reputation.

For.

Praise is the reflexion of virtue.

Praise is the honour that comes by free votes.

Honours are conferred by many forms of government; but praise comes everywhere of liberty.

The voice of the people has something divine; else how could so many agree in one thing?

Marvel not if the vulgar speak truer than the great, for they speak safer.

Against.

Fame is a worse judge than messenger.

What has a good man to do with the slaver of the common people?

Fame is like a river, it bears up the light and lets the solid sink.

The lowest virtues are praised by the common people, the middle are admired; but of the highest they have no sense or perception.

Praise is won by osten-

tation more than by merit, and follows the vain and windy more than the sound and real.

X. NATURE.

For.

Custom advances in an arithmetical ratio, nature in a geometrical.

As common laws are to customs in states, such is nature to custom in individuals.

Custom against nature is a kind of tyranny, and is soon and upon slight occasions overthrown.

Against.

We think according to our nature, speak as we have been taught, but act as we have been accustomed.

Nature is a schoolmaster, custom a magistrate.

XI. FORTUNE.

For.

Overt and apparent virtues bring forth praise; secret and hidden virtues bring forth fortune.

Virtues of duty bring forth praise; virtues of ability bring forth fortune.

Fortune is like the Milky Way; a cluster of obscure virtues without a name.

Fortune is to be hon-

Against.

The folly of one man is the fortune of another.

The best that can be said of fortune is that, as she uses no choice in her favours, so she does not care to uphold them.

Great men, to decline the envy of their own virtues, turn worshippers of fortune.

oured if it be but for her daughters, Confidence and Authority.

XII. Life.

For.

It is absurd to prefer the accidents of life to life itself.

A long course is better than a short one for everything, even for virtue.

Without a good space of life a man can neither finish, nor learn, nor repent.

Against.

Philosophers in making such preparations against death make death itself appear more fearful.

Men fear death, as children fear to go into the dark, because they know not what is there.

There is no human passion so weak but if it be a little roused it masters the fear of death.

A man might wish to die, though he were neither brave nor miserable nor wise, merely from weariness of being alive.

XIII. Superstition.

For.

They that err from zeal, though we cannot approve them, yet we must love them.

Mediocrities belong to matters moral; extremities to matters divine.

Against.

As the likeness of an ape to a man makes him all the more ugly, so does the likeness of superstition to religion.

Look how hateful affectation is in human affairs,

The religious man is called superstitious.

I had rather believe the most monstrous fables that are to be found in any religion, than that this world was made without a deity.

so hateful is superstition in divine.

Better have no opinion of God at all than an injurious one.

It was not the Epicureans but the Stoics that troubled the ancient states.

There is no such thing as a mere atheist in opinion; but great hypocrites are the true atheists, who are ever handling holy things without reverencing them.

XIV. Pride.

For.

Pride is unsociable to vices among other things; and as poison by poison, so not a few vices are expelled by pride.

The good-natured man is subject to other men's vices as well as his own; the proud man to his own only.

Let pride go a step higher, and from contempt of others rise to contempt of self, and it becomes philosophy.

Against.

Pride is the ivy that winds about all virtues and all good things.

Other vices do but thwart virtues; only pride infects them.

Pride lacks the best condition of vice — concealment.

The proud man while he despises others neglects himself.

XV. Ingratitude.

For.

The crime of ingratitude is nothing more than a clear insight into the cause of a benefit conferred.

In our desire to show gratitude to certain persons we sacrifice both the justice we owe to others and the liberty we owe to ourselves.

Before we are called on to be grateful for a benefit, let us be sure as to the value of it.

Against.

The crime of ingratitude is not restrained by punishments, but given over to the Furies.

The bonds of benefits are stricter than the bonds of duties; wherefore he that is ungrateful is unjust and every way bad.

This is the condition of humanity: no man is born in so public a fortune but he must obey the private calls both of gratitude and revenge.

XVI. Envy.

For.

It is natural for a man to hate that which reproaches to him his own fortunes.

Envy in commonwealths is a wholesome kind of ostracism.

Against.

Envy keeps no holidays.

Nothing but death can reconcile envy to virtue.

Envy puts virtues to laborious tasks, as Juno did Hercules.

XVII. Unchastity.

For.

It is owing to jealousy that chastity has been made a virtue.

A man must be of a

Against.

Unchastity was the worst of Circe's transformations.

He that is unchaste is

very sad disposition to think love a serious matter.

Why make a virtue of that which is either a matter of diet, or a show of cleanliness, or the child of pride?

Loves are like wildfowl; there is no property in them, but the right passes with the possession.

without all reverence for himself, which is the bridle of all vices.

All who like Paris prefer beauty, quit like Paris wisdom and power.

It was no vulgar truth that Alexander lighted on, when he said that sleep and lust were earnests of death.

XVIII. Cruelty.

For.

None of the virtues has so many crimes to answer for as clemency.

Cruelty, if it proceeds from revenge, is justice, if from danger, prudence.

He that has mercy on his enemy has no mercy on himself.

Bloodlettings are not oftener necessary in medicine than executions in states.

Against.

To delight in blood, one must be either a wild beast or a Fury.

To a good man cruelty always seems fabulous, and some tragical fiction.

XIX. Vain-Glory.

For.

He that would procure praise for himself must procure the benefit of other men.

Against.

Vain-glorious persons are ever factious, liars, inconstant, extreme.

Thraso is Gnatho's prey.

He who is so sober that he cares for nothing that is not his own business, I fear he thinks the good of the public to be no business of his.

Dispositions that have in them some vanity are readier to undertake the care of the commonwealth.

It is a shame for the suitor to woo the waiting-woman, and praise is the waiting-woman to virtue.

XX. Justice.

For.

Kingdoms and governments are but accessories to justice; for there would be no need of them if justice could be carried on without.

It is owing to justice that man is a god to man, and not a wolf.

Justice though it cannot extirpate vices, yet prevents them from doing hurt.

Against.

If to be just be not to do that to another which you would not have another do to you, then is mercy justice.

If everyone has a right to his own, surely humanity has a right to pardon.

What tell you me of equal measure, when to the wise man all things are equal?

Consider the condition of accused persons among the Romans, and conclude that justice is not for the good of the commonwealth.

The ordinary justice of governments is but as a

philosopher in the court — it merely conduces to the reverence of those who govern.

XXI. Fortitude.

For.

Nothing is to be feared except fear itself.

There is nothing either solid in pleasure, or secure in virtue, where fear intrudes.

He that looks steadily at dangers that he may meet them, sees also how he may avoid them.

Other virtues free us from the domination of vice, fortitude only from the domination of fortune.

Against.

A noble virtue, to be willing to die yourself in order to kill another!

A noble virtue, which a man may acquire by getting drunk!

He that is prodigal of his own life is dangerous to other men's.

Fortitude is the virtue of the iron age.

XXII. Temperance.

For.

The power of abstinence is not much other than the power of endurance.

Uniformity, concord, and measured motion, are attributes of heaven and characters of eternity.

Temperance is like wholesome cold; it col-

Against.

I like not these negative virtues; for they show innocence and not merit.

The mind grows languid that has no excesses.

I like those virtues which induce excellence of action, not dullness of passion.

lects and braces the powers of the mind.

Exquisite and restless senses need narcotics; so do passions.

If you will have the motions of the mind all consonant, you must have them few—for it is a poor man that can count his stock.

To abstain from the use of a thing that you may not feel the want of it, to shun the want that you may not fear the loss of it, are precautions of pusillanimity and cowardice.

XXIII. Constancy.

For.

Constancy is the foundation on which virtues rest.

Wretched is the man who knows not what himself may become.

Human judgment is too weak to be true to the nature of things, let it then at least be true to itself.

Even vices derive a grace from constancy.

If inconstancy of mind be added to the inconstancy of fortune, in what darkness do we live?

Fortune is like Proteus;

Against.

Constancy is like a surly porter; it drives much useful intelligence from the door.

It is fit that constancy should bear adversity well, for it commonly brings it on.

The shortest folly is the best.

if you persevere she returns to her shape.

XXIV. Magnanimity.

For.	*Against.*
If the mind do but choose generous ends to aim at, it shall have not only the virtues but the deities to help.	Magnanimity is a poetical virtue.
Virtues induced by habit or by precepts are ordinary; those imposed by a virtuous end are heroical.	

XXV. Knowledge, Contemplation.

For.	*Against.*
That pleasure is indeed according to nature, of which there is no satiety.	Contemplation is a specious idleness.
What prospect so sweet as to look down upon the errors of other men?	Good thoughts are little better than good dreams.
How good a thing to have the motion of the mind concentric with the universe!	Providence takes care of the world; do thou take care of thy country.
All depraved affections are but false estimations; and goodness and truth are the same thing.	A politic man uses his very thoughts for seed.

XXVI. Learning.

For.

If books were written about small matters, there would be scarce any use of experience.

In reading a man converses with the wise, in action generally with fools.

Sciences which are of no use in themselves are not to be deemed useless, if they sharpen the wit and put the thoughts in order.

Against.

In colleges men learn to believe.

What art ever taught the seasonable use of art?

To be wise by rule and to be wise by experience are contrary proceedings; he that accustoms himself to the one unfits himself for the other.

Art is often put to a foolish use, that it may not be of no use at all.

Almost all scholars have this — when anything is presented to them, they will find in it that which they know, not learn from it that which they know not.

XXVII. Promptitude.

For.

Wisdom that comes not quick comes not in season.

He that quickly errs quickly amends his error.

He that is wise in deliberation and not upon the moment does no great matters.

Against.

The wisdom that is ready at hand does not lie deep.

Wisdom is like a garment, it must be light if it be for speed.

He whose counsels are not ripened by delibera-

tion, his wisdom will not ripen with age.

Things speedily devised speedily fall out of favour.

XXVIII. Silence in matters of Secrecy.

For.

The silent man hears everything, for everything can be safely communicated.

He that is apt to tell what he knows, is apt to tell also what he knows not.

Mysteries are due to secrecy.

Against.

The best way of keeping the mind secret is to vary the manners.

Silence is the virtue of a confessor.

The silent man has nothing told him, because he gives nothing but silence in exchange.

To be close is next to being unknown.

XXIX. Facility.

For.

I love the man who yields to others' feelings, and yet keeps his judgment free.

To be pliant is to be most like gold.

Against.

Facility is a foolish privation of judgment.

Favours received from a man of facile disposition pass for debts; denials for injuries.

He that obtains a favour from a man of facile disposition thanks himself for it.

The facile man is oppressed with all difficul-

ties, for he involves himself in all.

The facile man seldom gets out of it without a blush.

XXX. Popularity.

For.

Wise men are commonly pleased with the same things; but to meet the various inclinations of fools is the part of wisdom.

To court the people is to be courted by the people.

Men that are themselves great find no single person to respect, but only the people.

Against.

He who agrees very well with fools may himself be suspected.

He that pleases the mob is apt to raise a mob.

Nothing that is moderate is liked by the common people.

The lowest of all flatteries is the flattery of the common people.

XXXI. Loquacity.

For.

He that is silent betrays want of confidence either in others or in himself.

All kinds of constraint are unhappy, that of silence is the most miserable of all.

Silence is the virtue of a fool. And therefore it was well said to a man that would not speak, "If you

Against.

Silence gives to words both grace and authority.

Silence is the sleep which nourishes wisdom.

Silence is the fermentation of thought.

Silence is the style of wisdom.

Silence aspires after truth.

are wise you are a fool; if you are a fool, you are wise."

Silence, like night, is convenient for treacheries.

Thoughts are wholesomest when they are like running waters.

Silence is a kind of solitude.

He that is silent lays himself out for opinion.

Silence neither casts off bad thoughts nor distributes good.

XXXII. Dissimulation.

For.

Dissimulation is a compendious wisdom.

We are not bound to say the same thing, but to aim at the same end.[1]

Nakedness is uncomely in the mind as well as in the body.

Dissimulation is both a grace and a guard.

Dissimulation is the fence of counsels.

Against.

If we cannot think according to the truth of things, let us at least speak according as we think.

When arts of policy are beyond a man's capacity, dissimulation must serve him for wisdom.

He that dissembles deprives himself of a principal instrument of action, namely trust and belief.

[1] *Non idem dicere, sed idem spectare, debemus:* a sentence in which I suspect that there is either some misprint or some inaccuracy of expression. — *J. S.*

There are some for whom it is good to be deceived.

He that does everything without dissimulation is not the less a deceiver; for most people either do not understand him or do not believe him.

Want of dissimulation is nothing but want of power over the mind.

Dissimulation invites dissimulation.

He that dissembles is not free.

XXXIII. Boldness.

For.

He that shows diffidence invites reproof.

What action is to an orator boldness is to a politician, — the first requisite, the second, and the third.

I love a confessing modesty, hate an accusing one.[1]

Confidence of manners brings minds the sooner together.

I like a reserved countenance and an open speech.

Against.

Boldness is the pioneer of folly.

Impudence is of no use except for imposture.

Confidence is the mistress of fools, and the sport of wise men.

Boldness is dullness of the sense joined with malice of the will.

[1] *Amo confitentem verecundiam, accusantem odi.* I do not understand this sentence. — *J. S.*

XXXIV. Ceremonies, Puntos, Affectation.

For.

A decorous government of the countenance and carriage is the true seasoning of virtue.

We comply with the vulgar in our words, why not in habit and gesture?

He that does not preserve decorum in trifles and daily habits may be a great man; but be sure of this, — such a man is not wise at all hours.

Virtue and wisdom without forms are like foreign languages; for they are not intelligible to the common people.

He that knows not the sense of the common people by an inward congruity, if he know it not by outward observation either, is of all men the most foolish.

Forms of behaviour are the translation of virtue into the vernacular.

Against.

What more uncomely than to make life a piece of acting?

From ingenuousness comes grace, from artifice hatred.

Better painted cheeks and curled hair than painted and curled manners.

He that applies his mind to such small observations, is not capable of great thoughts.

Affectation is the shining putrefaction of ingenuousness.

XXXV. Jests.

For.

A jest is the orator's altar.

Against.

Who does not despise these hunters after de-

He that throws into everything a dash of modest pleasantry keeps his mind the more at liberty.

To pass easily from jest to earnest and from earnest to jest is a thing more politic than men suppose.

A jest is many times the vehicle of a truth which would not otherwise have been brought in.

formities and prettinesses?

It is a dishonest trick to wash away with a jest the real importance of things.

Consider jests when the laugh is over.

These wits hardly penetrate below the surface of things, where jests ever lie.

Where a jest has any weight in serious matters, it is a childish levity.

XXXVI. Love.

For.

See you not that all men seek themselves? But it is only the lover that finds himself.

There is nothing which better regulates the mind than the authority of some powerful passion.

If you are wise, seek something to desire; for to him who has not some special object of pursuit all things are distasteful and wearisome.

Why should not one be content with one?

Against.

The stage is much beholden to love, life not at all.

Nothing has so many names as love; for it is a thing either so foolish that it does not know itself, or so foul that it hides itself with paint.

I hate those men of one thought.

Love is a very narrow contemplation.

XXXVII. Friendship.

For.

Friendship does the same things as fortitude, but more sweetly.

Friendship is a sweet seasoning to all other blessings.

It is the worst solitude, to have no true friendships.

It is a retribution worthy of bad faith to be deprived of friendships.

Against.

He that contracts close friendships imposes upon himself new necessities.

It is the part of a weak mind to go shares in fortune.

XXXVIII. Flattery.

For.

Flattery proceeds more from manners than malice.

To suggest what a man should be under colour of praising what he is, was ever a form due in civility to the great.

Against.

Flattery is the style of slaves.

Flattery is the refuse of vices.

The flatterer is like the fowler that deceives birds by imitating their cry.

The unseemliness of flattery is matter of comedy, its mischief of tragedy.

Nothing so hard to cure as the ear.

XXXIX. Revenge.

For.

Revenge is a kind of wild justice.

Against.

He that did the first wrong made a beginning

He who requites violence with violence, sins against the law but not against the man.

The fear of private revenge is a useful thing; for laws too often sleep.

of mischief, he that returned it made no end.

The more natural revenge is, the more need to restrain it.

He that is ready to return an injury was behindhand more in time perhaps than in will.

XL. Innovation.

For.

Every medicine is an innovation.

He that will not have new remedies will have new evils.

Time is the greatest innovator, why then should we not imitate time?

Ancient precedents are unfit, modern ones corrupt and interested.

Leave it to the unskilful and the contentious to act by precedent.

As those who first bring honour into their family are commonly worthier than their descendants, so are the first precedents commonly better than the imitations of them.

Against.

Things new born are ill-shapen.

The only author I like is time.

There is no novelty that does not some hurt, for it unsettles what is.

Things settled by custom, though they be not good, yet at least they fit one with another.

What innovator imitates time, who so insinuates his innovations that they are not perceived?

That which comes unlooked for gets the less thanks from him whom it helps, and gives the more annoyance to him whom it hurts.

A froward retention of custom is as turbulent a thing as an innovation.

Seeing that things alter of themselves to the worse, if counsel shall not alter them to the better, what shall be the end?

The slaves of custom are the sport of time.

XLI. Delay.

For.

Fortune sells many things to him that is in a hurry, which she gives to him that waits.

While we hasten to take hold of the beginnings of things, we grasp shadows.

While things are wavering, watch; when they have taken their direction, act.

Commit the beginnings of actions to Argus, the end to Briareus.

Against.

Opportunity offers the handle of the bottle first, and afterwards the belly.

Opportunity is like the Sibyl; she raises the price as she diminishes the offer.

Speed is Pluto's helmet.

Things that are done betimes are done with judgment; things that are put off too late, by circuit.[1]

XLII. Preparation.

For.

He that attempts a great

Against.

The time to cease pre-

[1] *Per ambitum:* meaning, I suppose (if the reading be correct), that at first you can choose the best way, but at last you must take the way that offers. — *J. S.*

matter with small means, does but provide himself with an occasion of hoping.

With small preparations you may purchase wisdom, but not fortune.

paring is the instant you can begin acting.

Let no man hope that he can bind fortune by preparation.

To interchange preparation and action is politic, to part them is vain and unfortunate.

Great preparation wastes both time and matter.

XLIII. Meeting the First Move.

For.

More dangers have deceived men than forced them.

It is less trouble to apply the remedy to a danger than to keep watch upon the approach of it.

A danger is no more light, if it once seem light.

Against.

He that arms himself to meet danger teaches it to come on, and in remedying fixes it.

The very remedies of dangers carry little dangers in them.

It is better to have to deal with a few dangers in their maturity, than with the menaces of every one.

XLIV. Violent Counsels.

For.

For those who embrace this mild kind of wisdom an increase of the evil is salutary.

Necessity, which gives

Against.

Every violent remedy is pregnant with some new evil.

The only violent counsellors are anger and fear.

violent counsels, also executes them.

XLV. Suspicion.

For.

Distrust is the sinews of wisdom, but suspicion is a medicine for the joints.

His faith is justly suspected whose faith suspicion shakes.

Suspicion loosens a frail faith, but braces a strong one.

Against.

Suspicion discharges faith.

The distemper of suspicions is a kind of civil madness.

XLVI. The Words of the Law.

For.

The interpretation which departs from the letter is not interpretation but divination.

When the letter is departed from, the judge becomes the law-giver.

Against.

The sense according to which each word is to be interpreted must be gathered from all the words together.

The worst tyranny is the torturing of the law.

XLVII. For Witnesses against Arguments.

For.

He who relies on arguments decides according to the merits of the pleader, not of the cause.

He who believes arguments more than witnesses, ought to give more

Against.

If witnesses are to be believed in spite of arguments, it is enough if the judge be not deaf.

Arguments are the antidote against the poison of testimony.

credit to the wit than the senses.

Arguments might be trusted, if men never acted absurdly.

Arguments, when opposed to testimony, may make a fact seem strange, but cannot make it seem not a fact.

It is safest to believe those proofs which seldomest lie.

These Antitheses (which I have here set down) are perhaps of no great value; but as I had long ago prepared and collected them, I was loth to let the fruit of my youthful industry perish — the rather because (if they be carefully examined) they are *seeds* only, not *flowers*. In one respect indeed they savour altogether of youth, there being plenty of them in the moral and demonstrative kind, but in the deliberative and judicial very few.

The third Collection, which belongs to the Promptuary, or Preparatory Store, and is likewise deficient, is that of what I call *Lesser Forms*. I mean those parts of speech which answer to the vestibules, back doors, ante-chambers, withdrawing-chambers, passages, &c., of a house; and may serve indiscriminately for all subjects. Such are prefaces, conclusions, digressions, transitions, intimations of what is coming, excusations, and a number of the kind. For as in buildings it is a great matter both for pleasure and use that the fronts, doors, windows, approaches, passages, and the like be conveniently arranged, so also in a speech

these accessory and interstitial passages (if they be handsomely and skilfully fashioned and placed) add a great deal both of ornament and effect to the entire structure. Of these Forms I will subjoin one or two examples, without dwelling longer upon them. For though they be matters of no small use, yet as I have nothing of my own to add in this part, but merely transcribe the naked forms out of Demosthenes or Cicero or some other chosen author, they are not of that importance that I should spend time upon them.

Examples of *Lesser Forms*.

A Conclusion in a Deliberative.

So may we redeem the fault passed and at the same time prevent the inconveniences to come.

Corollary of an accurate Distribution.

That all may know that I have no wish either to evade anything by silence or to obscure it by speech.[1]

A Transition with a Hint.

Let us pass these things, and yet not without marking and turning back to look at them as we go by.[2]

A Form to preoccupy the Mind against an Opinion previously formed.

I will make you understand in all this business how much is truth, how much error, and how much envy.[3]

[1] Cic. Pro Cluent. c. 1. [2] Cic Pro Sext. c. 5.
[3] Cic. Pro Cluent. c. 4.

These few may be enough by way of examples; and with these I conclude the Appendices to Rhetoric, which belong to the Promptuary.

CHAP. IV.

Two General Appendices of the Art of Transmission; Critical and Pedagogical.

THERE remain two appendices touching the transmission of knowledge in general; the one Critical, the other Pedagogical. For as the principal part of transmission of knowledge consists in the writing of books, so the relative part thereof turns on the reading of books. Now reading is either directed by teachers, or attained by each man's own endeavours; and to this these two knowledges which I have mentioned appertain.

To the Critical part belongs, first, the true correction and amended edition of approved authors; whereby both themselves receive justice and their students light. Yet in this the rash diligence of some has done no little harm. For many critics, when they meet a passage which they do not understand, immediately suppose that there is a fault in the copy. As in that passage of Tacitus, where he relates that when a certain colony asserted before the senate the right of asylum, their arguments were not very favourably listened to by the emperor and the senate; whereupon the ambassadors, fearing for the success of their cause, gave a good sum of money to Titus Vinius to support them — by which means they prevailed. "Then" (says Tacitus) "the dignity and antiquity of the colony had its

weight;"[1] meaning that the arguments which appeared light before gained fresh weight by the money. But a critic, and he not one of the worst, here erased the word *tum*, and substituted *tantum*. And this bad habit of critics has brought it to pass that (as some one has wisely remarked) "the most corrected copies are often the least correct." Moreover, to speak truly, unless critics be learned in the sciences which the books they edit treat of, their diligence is not without its danger.

Secondly, there belongs to the Critical part the interpretation and explication of authors, — commentaries, scholia, annotations, collections of beauties, and the like. In labours of this kind however some of the critics have been visited with that very bad disease, of leaping over many of the obscurer places, while they linger and expatiate to tediousness on those which are clear enough; as if the object were not so much to illustrate the author as to display on every possible opportunity the extensive learning and various reading of the critic himself. It were especially to be desired (though this is a matter which belongs rather to the art of transmission in the main, than to the appendices thereof) that every writer who handles arguments of the obscurer and more important kind, should himself subjoin his own explanations; that so the text may not be interrupted by digressions and expositions, and the notes may not be at variance with the writer's meaning. Something of the kind I suspect in Theon's Commentary on Euclid.

There belongs thirdly to the Critical part (and from this indeed it derives its name) the insertion of some

[1] Cf. Tacitus, Hist. i. 66. The case is incorrectly stated. See Mr. Ellis's note, vol. ii. p. 492. — *J. S.*

brief judgment concerning the authors edited, and comparison of them with other writers on the same subjects; that students may by such censure be both advised what books to read and better prepared when they come to read them. This last office is indeed, so to speak, the critic's chair; which has certainly in our age been ennobled by some great men, — men in my judgment above the stature of critics.

As for the Pedagogical part, the shortest rule would be, "Consult the schools of the Jesuits;" for nothing better has been put in practice. Nevertheless I will as usual give a few hints, gleaning an ear here and there. I am clearly in favour of a collegiate education for boys and young men; not in private houses, nor merely under schoolmasters. For in colleges there is a greater emulation of the youths amongst themselves; there is also the sight and countenance of grave men, which tends to modesty, and forms their young minds from the very first after that model; and in short there are very many advantages in a collegiate education. For the order and manner of teaching, I would say first of all, — avoid abridgments and a certain precocity of learning, which makes the mind over bold, and causes great proficiency rather in show than in fact. Also let some encouragement be given to the free exercise of the pupils' minds and tastes; I mean, if any of them, besides performing the prescribed exercises, shall steal time withal for other pursuits to which he is more inclined, let him not be checked. Observe moreover (what perhaps has not hitherto been remarked) that there are two ways of training and exercising and preparing the mind, which proceed in opposite directions. The one begins with the easier tasks, and so

leads on gradually to the more difficult; the other begins by enforcing and pressing the more difficult, that when they are mastered the easier ones may be performed with pleasure. For it is one method to begin swimming with bladders, which keep you up; and another to begin dancing with heavy shoes, which weigh you down. Nor is it easy to tell how much a judicious intermixture of these methods helps to advance the faculties of the mind and body. Again, the application and choice of studies according to the nature of the mind to be taught, is a matter of wonderful use and judgment; the due and careful observation whereof is due from the masters to the parents, that they may be able to advise them as to the course of life they should choose for their sons. And herein it should be carefully observed, that as a man will advance far fastest in those pursuits to which he is naturally inclined, so with respect to those for which he is by defect of nature most unsuited there are found in studies properly chosen a cure and remedy for his defects. For example, if one be bird-witted, that is easily distracted and unable to keep his attention as long as he should, Mathematics provides a remedy; for in them if the mind be caught away but a moment, the demonstration has to be commenced anew. Exercises, again, it is obvious, play the principal part in instruction. But few have observed that there ought to be not only a wise choice and course of exercises, but a wise intermission of them also; for it is well observed by Cicero, "that men in their exercises for the most part exercise their faults as well as their faculties,"[1] so that an ill habit is sometimes acquired along with the good. It is

[1] Cic. De Orator. i. 33.

safer therefore to intermit exercises from time to time and return to them after a while, than continually to pursue and press them. But enough of this. Certainly these are matters not very grand or imposing at first sight, yet of singular fruit and efficacy. For as the good or ill thriving of plants depends chiefly upon the good or ill treatment they received when they were young and tender; and as the immense increase of the Roman empire is by some deservedly attributed to the virtue and wisdom of the first six kings, who were in truth as the tutors and guardians of it in its infancy;[1] so surely the culture and ordering of youthful or tender years has a power which, though latent and not perceptible to everybody, neither length of time nor assiduity and earnestness of labour in mature age can afterwards countervail. It will not be amiss to observe also, that even mean faculties, when they fall into great men or great matters, sometimes work great and important effects. Of this I will adduce a memorable example; the rather, because the Jesuits appear not to despise this kind of discipline; therein judging (as I think) well. It is a thing indeed, if practised professionally, of low repute; but if it be made a part of discipline, it is of excellent use. I mean stage-playing: an art which strengthens the memory, regulates the tone and effect of the voice and pronunciation, teaches a decent carriage of the countenance and gesture, gives not a little assurance, and accustoms young men to bear being looked at. The example which I shall give, taken from Tacitus, is that of one Vibulenus, formerly an actor, then a soldier in the Pannonian legions. This man had at

[1] Macchiavelli, Discorsi, i. 19.

the death of Augustus raised a mutiny, whereupon Blæsus, the lieutenant, committed some of the mutineers to prison. The soldiers however broke in and let them out; whereupon Vibulenus getting up to speak, began thus; "These poor innocent wretches you have restored to light and life; but who shall restore life to my brother, or my brother to me? whom, being sent hither in message from the legions of Germany, to treat of the common cause, this man has murdered last night by some of his swordsmen, whom he keeps and arms for the execution of soldiers. Answer, Blæsus, where have you thrown his body? Enemies themselves deny not burial. When with kisses and tears I shall have satiated my grief, command me also to be slain beside him; only let these my fellows, seeing we are put to death for no crime, but because we consulted for the good of the legions, have leave to bury us." With which words he excited such excessive jealousy and alarm, that, had it not shortly afterwards appeared that nothing of the sort had happened, nay, that he had never had a brother, the soldiers would hardly have kept their hands off the prefect; but the fact was that he played the whole thing as if it had been a piece on the stage.

And now I am come to the end of my treatise concerning Rational Knowledges; wherein if I have sometimes made the divisions other than those that are received, yet let it not be thought that I disallow all those divisions which I do not use. For there is a double necessity imposed upon me of altering the divisions. First, because to reduce into one class things next in nature, and to gather into one bundle things wanted for use, are operations differing in the very

end and intention. For as a secretary of a king or state, when he arranges his papers in his study or general cabinet, puts those things together, no doubt, which are of like nature, — treaties by themselves in one place, instructions by themselves in another, foreign letters, domestic letters, and the like, each apart by themselves, — but when on the contrary he arranges them in his boxes or particular cabinet, he puts those together which, though of different kinds, he thinks he will have occasion to use together; so in this general cabinet of knowledge it was necessary for me to make the divisions according to the nature of the things themselves, whereas if I had been to handle any particular knowledge I should have adopted the divisions fittest for use and practice. Secondly, because the introduction of the *Desiderata*, and the incorporation of them with the rest, involved as a consequence an alteration in the distribution of the existing sciences. For suppose (by way of demonstration) that the arts which we now have are as 15, and that the same with the desiderata added are as 20; I say that the factors of the number 15 are not the same with the factors of the number 20. For the factors of 15 are 3 and 5; the factors of 20 are 2, 4, 5, and 10. It is plain therefore that these things could not be otherwise. And so much for the Logical Sciences.

OF

THE ADVANCEMENT OF LEARNING.

BOOK VII.

CHAPTER I.

The Division of Moral Knowledge into the Exemplar or Platform of Good, and the Georgics or Culture of the Mind. The Division of the Platform of Good, into Simple and Comparative Good. The Division of Simple Good into Individual Good, and Good of Communion.

We come now, most excellent king, to moral knowledge, which respects and considers the will of man. The will is governed by right reason, seduced by apparent good, having for its spurs the passions, for its ministers the organs and voluntary motions; wherefore Solomon says, "Above all things keep thy heart with all diligence, for out of it are the issues of life."[1] In the handling of this science, the writers seem to me to have done as if a man who, professing to teach the art of writing, had exhibited only fair copies of letters, single and joined, without giving any direction for the carriage of the pen and framing of the characters. So

[1] Prov. iv. 23.

have these writers set forth good and fair copies, and accurate draughts and portraitures of good, virtue, duty, and felicity, as the true objects for the will and desires of man to aim at. But though the marks themselves be excellent and well placed, how a man may best take his aim at them; that is, by what method and course of education the mind may be trained and put in order for the attainment of them, they pass over altogether, or slightly and unprofitably. We may discourse as much as we please that the moral virtues are in the mind of man by habit, and not by nature, and we may make a formal distinction that generous spirits are won by doctrines and persuasions, and the vulgar sort by reward and punishment; or we may give it in precept that the mind like a crooked stick must be straightened by bending it the contrary way,[1] and the like scattered glances and touches; but they would be very far from supplying the place of that which we require.

The reason of this neglect I suppose to be that hidden rock whereupon both this and so many other barks of knowledge have struck and foundered; which is, that men have despised to be conversant in ordinary and common matters which are neither subtle enough for disputation, nor illustrious enough for ornament. It is hard to compute the extent of the evil thus introduced; namely, how from innate pride and vain glory men have chosen those subjects of discourse, and those methods of handling them, which rather display their own genius than benefit the reader. Seneca says well, "Eloquence is injurious to those whom it inspires with a fondness for itself, and not for the subject;"[2] for

[1] Arist. Nic. Eth. ii. 9.

[2] Seneca, Epist. 52.

writings should be such as should make men in love with the lesson, and not with the teacher. They therefore are on the right path, who can say the same of their counsels as Demosthenes did of his, and conclude with this sentence, "If you do what I advise you will not only praise the orator at the time, but in no long time yourselves also, by reason of the better condition of your affairs." [1] For myself, most excellent king, I may truly say that both in this present work, and in those I intend to publish hereafter, I often advisedly and deliberately throw aside the dignity of my name and wit (if such thing be) in my endeavour to advance human interests; and being one that should properly perhaps be an architect in philosophy and the sciences, I turn common labourer, hodman, anything that is wanted; taking upon myself the burden and execution of many things which must needs be done, and which others through an inborn pride shrink from and decline. But to return to the subject: moral philosophers have chosen for themselves a certain glittering and lustrous mass of matter, wherein they may principally glorify themselves for the point of their wit, or the power of their eloquence; but those which are of most use for practice, seeing that they cannot be so clothed with rhetorical ornaments, they have for the most part passed over.

Neither needed men of so excellent parts to have despaired of a fortune, which the poet Virgil promised to himself, and indeed obtained; who got as much glory of eloquence, wit, and learning in the expressing of the observations of husbandry, as of the heroical acts of Æneas;

[1] Demosth. Olynth. ii.

Nec sum animi dubius, verbis ea vincere magnum
Quam sit, et angustis his addere rebus honorem.[1]

And surely, if the purpose be in good earnest, not to write at leisure that which men may read at leisure, but really to instruct and suborn action and active live, these Georgics of the Mind are no less worthy to be had in honour than the heroical descriptions of virtue, goodness, and felicity, whereon so much labour has been spent.

Wherefore I will divide moral knowledge into two principal parts; the one "the *Exemplar* or *Platform of Good*," the other "the *Regiment* or *Culture of the Mind*," which I also call the *Georgics of the Mind;* the one describing the nature of good, the other prescribing rules how to accommodate the will of man thereunto.

The doctrine touching the platform or nature of good, considers good either Simple or Comparative: either the kinds of good, or the degrees of good; in the latter whereof those infinite disputations and speculations touching the supreme degree thereof, which they termed "Felicity," "Beatitude," or the "Highest Good" (which were as the heathen Divinity), are by the Christian faith removed and discharged. And as Aristotle says, "That young men may be happy, but only by hope,"[2] so we, instructed by the Christian faith, must all acknowledge our minority, and content ourselves with that felicity which rests in hope.

Freed therefore happily, and delivered from this doctrine of the heathen heaven, whereby they cer-

[1] Virg. Georg. iii. 289.: —

How hard the task, alas, full well I know,
With charms of words to grace a theme so low.

[2] Arist. Nic. Eth. i. 10.

tainly imagined a higher elevation of man's nature than it is really capable of (for we see in what height of style Seneca writes, "It is true greatness to have the frailty of a man and the security of a god"[1]), we may with more sobriety and truth receive the rest of what they have delivered concerning the doctrine of the Exemplar; wherein, for the nature of good Positive or Simple, they have painted it excellently and to the life, as in a picture, diligently representing the forms of virtues and duties, their situations and their postures, kinds, relations, parts, subjects, provinces, actions, administrations, and the like; nay further, they have commended and insinuated them into man's nature and spirit with great quickness of argument and beauty of persuasions; yea, and fortified and entrenched them, as much as discourse can do, against corrupt and popular opinions. Again, for the nature of Comparative Good, they have also excellently well handled it, in their triplicity of good; in the comparison between a contemplative and active life; in the distinction between virtue with reluctation, and virtue settled and secured; in their encounters between honesty and profit; in their balancing of virtue with virtue, as to which outweighs the other, and the like; so that I find that this part is excellently laboured, and that the ancients have done their work admirably therein, yet so as the pious and earnest diligence of divines, which has been employed in weighing and determining duties, moral virtues, cases of conscience, the bounds of sin, and the like, has left the philosophers far behind.

Notwithstanding (to return to the philosophers), if

[1] Seneca, Epist. 53.

before they had come to the popular and received notions of virtue and vice, pleasure and pain, and the rest, they had stayed a little longer upon the inquiry concerning the roots of good and evil, and the strings of those roots; they had given in my opinion a great light to those questions which followed; and especially if they had consulted with the nature of things, as well as moral axioms, they had made their doctrines less prolix, and more profound; which being by them in part omitted, and in part handled with much confusion, I will briefly resume; and endeavour to open and cleanse the fountains of morality, before I come to the knowledge of the culture of the mind, which I set down as deficient. For this will in my opinion reinforce the doctrine of the exemplar with new strength.

There is formed and imprinted in everything an appetite toward two natures of good; the one as everything is a total or substantive in itself, the other as it is a part or member of a greater body; whereof the latter is in degree the greater and the worthier, because it tends to the conservation of a more general form. The former of these may be termed "Individual or Self-good," the latter the "Good of Communion." Iron in particular sympathy moves to the loadstone, but yet, if it exceed a certain quantity it forsakes its affection to the loadstone, and like a good patriot moves to the earth, which is the region and country of its connaturals; so again, compact and massy bodies move to the earth, the great collection of dense bodies; and yet rather than suffer a divulsion in nature and create a vacuum, they will move upwards from the centre of the earth, forsaking their duty to the earth in regard to their duty to the world.

Thus it is ever the case, that the conservation of the more general form controls and keeps in order the less er appetites and inclinations. This prerogative of the communion of good is much more engraven upon man, if he be not degenerate; according to that memorable speech of Pompey, when being in commission of purveyance for a famine at Rome, and being dissuaded with great vehemency and instance by his friends about him that he should not hazard himself to sea in an extremity of weather, he said only to them, "It is needful that I go, not that I live;" [1] so that the love of life, which is the predominant feeling in the individual, did not with him outweigh affection and fidelity to the commonwealth. But why do I dwell on this point? for never in any age has there been any philosophy, sect, religion, law, or other discipline, which did so highly exalt the good which is communicative, and depress the good which is private and particular, as the Holy Christian Faith; well declaring that it was the same God, who gave the Christian law to men, that gave also those laws of Nature to inanimate creatures; whence we read that some of the elected saints of God have wished, rather than that their brethren should not obtain salvation, that they themselves should be anathematized and erased out of the book of life, in an ecstasy of charity and infinite feeling of communion.[2]

This being set down and strongly planted, judges and determines some of the most important controversies in moral philosophy. For first it decides the question touching the preferment of the contemplative or active life, and decides it against Aristotle. For all

[1] Plut. in Pomp. c. 50.

[2] St. Paul, Romans, ix. 3.; and Exod. xxxii. 32.

the reasons which he brings for the contemplative respect private good, and the pleasure or dignity of a man's self; in which respects no question the contemplative life has the pre-eminence, being not much unlike that comparison which Pythagoras made for the gracing and magnifying of philosophy and contemplation; who, being asked by Hiero what he was, answered, "that if Hiero were ever at the Olympian games, he knew the manner, that some came to try their fortune for the prizes; and some came as merchants to utter their commodities; and some came to make good cheer, and meet their friends; and some came to look on; and that he was one of them that came to look on." [1] But men must know that in this theatre of man's life it is reserved only for God and Angels to be lookers on; neither could the like question ever have been raised in the Church (notwithstanding it has been in the mouths of many, "Right dear in the sight of the Lord is the death of his Saints," [2] by which text they used to exalt that civil death of theirs, and the orders and rules of the life monastic); were it not true withal that the monastical life is not simply contemplative, but engaged also in the performance of certain ecclesiastical duties, such as continual prayer, and votive sacrifices offered to God, and the leisurely writing of theological books for advancing the knowledge of the divine law; as Moses did, when he abode so long in the Mount. And so we see, that Enoch, the seventh from Adam, who seems to have been the first contemplative (for he is said to have walked with God [3]), yet also endowed the

[1] Iamblichus in Vitâ, and Cic. Tusc. Quæst. v. 3.
[2] Psalm cxvi. 15.
[3] Gen. v. 24.

Church with a book of prophecy, which St. Jude cites.[1] But for mere contemplation which should be finished in itself without casting beams of heat and light upon society, assuredly divinity knows it not. It decides also the question so earnestly argued between the schools of Zeno and Socrates on the one hand, who placed felicity in virtue simple or attended, which is ever chiefly concerned with the duties of life; and on the other hand, the numerous other sects, as the Cyrenaics and Epicureans, who placed it in pleasure, and made virtue (as it is used in some comedies, wherein the mistress and the maid change habits) to be but as a servant, without which pleasure cannot be properly served and attended; and the reformed school of the Epicureans, which pronounced felicity to be nothing else than the tranquillity and serenity of a mind free from perturbation (as if they would have deposed Jupiter again, and restored Saturn with the Golden Age, when there was neither summer nor winter, spring nor autumn, but all after one air and season); and lastly, that exploded school of Pyrrho and Herillus, who placed felicity in the removal from the mind of all doubts and scruples, admitting no fixed and consistent nature of good and evil, but esteeming actions good or evil, according as they proceed from the mind acting clearly and regularly, or with reluctance and aversion; which opinion was revived in the heresy of the Anabaptists, who measured all things according to the notions or instincts of the spirit, and the constancy or wavering of belief. Now all the points above enumerated manifestly regard private repose and contentment, and not the good of society.

[1] Jude, Epist. 14.

It censures also the philosophy of Epictetus, who presupposes that felicity must be placed in those things which are in our power, lest we be subject to fortune and disturbance; as if it were not a thing much more happy to fail in good and virtuous ends for the public, than to obtain all that we can wish to ourselves in our private fortune; as Gonsalvo, addressing his soldiers and pointing to Naples, nobly protested, "He had rather die one foot forwards, than secure a long life by one foot of retreat."[1] Whereunto agrees the wisdom of that heavenly leader, who has affirmed "that a good conscience is a continual feast,"[2] showing plainly that the conscience of good intentions howsoever failing in success imparts a joy truer, surer, and more agreeable to nature, than all the provision which a man can make either for the satisfying of his desires or for the repose of his mind.

It censures likewise that abuse of philosophy which grew general about the times of Epictetus in converting it into an occupation or profession, as if the business of philosophy had been not to resist and extinguish perturbations, but to fly and avoid the causes and occasions of them, and to shape a particular kind and course of life to that end; introducing such a health of mind, as was that health of body cultivated by Herodicus, of whom Aristotle tells us, that he did nothing all his life long but attend his health, and accordingly abstained from an infinite variety of things, depriving himself as it were of the use of his body in the meantime.[3] Whereas, if men refer themselves to duties of society, as that state of body is most to be desired which is best able to endure and overcome all changes and extremi-

[1] Guicciard. vi. 2. [2] Prov. xv. 15. [3] Rhet. i. 5. 10.

ties; so likewise that mind is to be esteemed truly and properly healthy which can go through the greatest temptations and perturbations: so that Diogenes's opinion seems excellent, who commended that strength of mind which enabled a man not to abstain but to sustain, and which could refrain its impetuosity even in the steepest precipices, and give it the property of a well broken horse, that of stopping and turning most quickly and suddenly.

Lastly, it censures also the tenderness and want of compliance in some of the most ancient and reverend philosophers, who retired too easily from civil business that they might avoid indignities and perturbations, and live (as they thought) more pure and saint-like; whereas the resolution of men truly moral ought to be such as the same Gonsalvo required in a soldier, "whose honour," he said, "should be of a stouter web, and not so fine as that everything should catch in it, and rend it."

CHAP. II.

The Division of Individual, or Self-good, into Active and Passive Good. — The Division of Passive Good into Conservative and Perfective Good. — The Division of the Good of Communion, into General and Respective Duties.

To resume then, and pursue first private and self good, we will divide it into *Good Active and Good Passive;* for this difference of good, not unlike to that which, amongst the Romans, was expressed in the

familiar or household terms of "Promus" and "Condus," is formed also in all things, and is best disclosed in the two several appetites in creatures; the one, to preserve or continue themselves: and the other, to multiply and propagate themselves; whereof the latter, which is active and as it were the promus, seems to be the stronger and more worthy; and the former, which is passive and as it were the condus, seems to be inferior. For in the universe, the heavenly nature is mostly the agent, the earthly nature the patient; in the pleasures of living creatures, that of generation is greater than that of food; in divine doctrine, "It is more blessed to give than to receive,"[1] and in common life, there is no man's spirit so soft and effeminate but esteems the effecting of somewhat that he has fixed in his desire more than any pleasure or sensuality. And this pre-eminence of the active good is infinitely raised by the consideration that the condition of man is mortal, and exposed to the blows of fortune; for if we might have a certainty and perpetuity in our pleasures, the certainty and continuance of them would advance their price. But when we see it is but thus with us, "We count it much to postpone death for awhile;"[2] "Boast not thyself of the morrow; Thou knowest not what a day may bring forth;"[3] it is no wonder that we earnestly pursue such things as are secured and exempted from the injuries of time, which are only our deeds and our works; as it is said, "Their works follow them."[4] There is also another important pre-eminence of the active good, produced and upheld by that affection which is inseparable from human nature;

[1] Luke, xiv. 12–14.; Acts, xx. 35.
[2] Seneca, Nat. Quæst. ii. 59.
[3] Prov. xxvii. 1.
[4] Rev. xiv. 13.

the love of novelty and variety; which in the pleasures of the sense (which is the principal part of passive good) is very confined, and can have no great latitude.[1] "Only think how often you do the same thing over and over. Food, Sleep, Play, come round in a perpetual circle; a man might wish to die, not only from fortitude or misery or wisdom, but merely from disgust and weariness of life." But in enterprises, pursuits and purposes of life there is much variety; whereof men are sensible with pleasure in their inceptions, progressions, rests, recoils, reintegrations, approaches, and attainings to their ends; so as it was well said, "Life without a purpose is unsettled and languid."[2] And this befalls as well the wise as the foolish; as Solomon says, "A heady man seeks to satisfy his desire, and intermeddles with everything."[3] And we see that the greatest kings who might have at command everything which can gratify the sense, have yet sometimes affected mean and frivolous pursuits (as was the passion of Nero for the harp, of Commodus for gladiatorial combats, of Antoninus for chariot-driving, and the like); which nevertheless they esteemed more of than of the whole abundance of sensual pleasures; so much pleasanter is it to be doing than to be enjoying.

But here it must be more carefully observed, that this active individual good has no identity with the good of society, though in some case it has an incidence into it: for although it many times produces and brings forth acts of beneficence (which is a virtue of communion), yet there is this difference, that these acts are mostly done not with a view to the benefit

[1] Seneca, Ep. 77. [2] Seneca, Ep. 95.
[3] Cf. Prov. xviii. 1.

and happiness of others, but to a man's own power and greatness; as plainly appears when this kind of active good strikes on a subject contrary to the good of society. For that gigantean state of mind, which possesses the troublers of the world (such as was Lucius Sylla, and infinite others in smaller model, who are bent on having all men happy or unhappy as they are their friends or enemies, and would shape the world according to their own humours, which is the true Theomachy), this I say aspires to the active good of the individual (apparent good at least), though it recedes farthest of all from the good of society.

But Passive good is subdivided into *Conservative and Perfective.* For there is impressed on all things a triple desire or appetite, in respect of self or individual good; one of preserving, another of perfecting, and a third of multiplying and spreading themselves: whereof the last is that which we have just handled by the name of "Active good," so that there remain only the two other goods which we have mentioned; whereof that of perfecting is the highest; for to preserve a thing in its existing state is the less, to raise the same to a higher nature is the greater. For in all things there are some nobler natures to the dignity and excellence whereof inferior natures aspire as to their sources and origins. So it was not unfitly said of men "that they have a fiery vigour and a heavenly origin,"[1] for the assumption or approach of man to the Divine or Angelical nature is the perfection of his form; the false and preposterous imitation of which perfective good is the very plague and stormy whirlwind of human life,

[1] Virg. Æn. vi. 7. 30.:—

Igneus est ollis vigor et cœlestis origo.

which carries off and destroys everything; while men upon the instinct of an advancement formal and essential are carried by a blind ambition to seek an advancement merely local. For as those who are sick, and find no remedy, tumble up and down and change place, as if by a remove local they could obtain a remove internal, and get away from themselves and from the disease that is within them; so is it in ambition, when men possessed by a false idea of exalting their nature obtain nothing else but an eminence and exaltation of place.

The good of conservation consists in the reception and fruition of that which is agreeable to our natures; which, though it seems to be the most pure and natural of pleasures, is yet the softest and the lowest. And this also receives a difference, which has in part been weakly judged, in part not examined; for the good of fruition, or (as it is commonly termed) pleasure, is placed either in the sincerity of the fruition, or in the vigour of it; the one of which is the result of equality; the other of variety and vicissitude; the one having less mixture of evil, the other a stronger and more lively impression of good. Which of these is the greater good, is a question controverted, but whether man's nature may not be capable of both is a question not inquired. The former question being debated in a dispute between Socrates and a sophist, Socrates placing felicity in an equal and constant peace of mind, and the sophist in much desiring and much enjoying, they fell from arguments to ill words; the sophist saying that "Socrates's felicity was the felicity of a block or stone," [1] and Socrates saying, "that the

[1] Plato, Gorgias, p. 494.

sophist's felicity was the felicity of one that had the itch, who did nothing but itch and scratch." And both these opinions do not want their supports; for the opinion of Socrates is much upheld by the general consent even of the Epicureans, who did not deny that virtue bears a great part in felicity; and if so, certain it is, that virtue has more use in clearing perturbations, than in compassing desires. But the sophist's opinion is somewhat favoured by the assertion we last spoke of, "that good of advancement is greater than good of simple preservation," because every obtaining a desire has a show of advancing nature towards perfection; which though it be not really the case, yet motion even in a circle has a show of progression.

But the second question (as to whether a man's nature may not be capable of tranquillity of mind and vigour of fruition both), decided in the true way, makes the former superfluous. For do we not often see some minds so constituted, as to take the greatest delight in enjoying pleasures when present, and yet nevertheless little annoyed at the loss and leaving of them? so that the philosophical progression; "Enjoy not, that you may not desire; desire not, that you may not fear;" is the precaution of cowardice and pusillanimity. And indeed most of the doctrines of the philosophers seem to me to be more fearful and cautionary than the nature of things requires: thus they increase the fear of death in offering to cure it; for when they would have a man's whole life to be but a discipline or preparation to die, they must needs make men think that it is a terrible enemy, against whom there is no end of preparing. Better says the poet (for a heathen): —

Fortem posce animum mortis terrore carentem
Qui finem vitæ extremum inter munera ponat
Naturæ.[1]

So have philosophers sought in all things to make men's minds too uniform and harmonical, not breaking them to contrary motions and extremes; the reason whereof I suppose to be, because they themselves were men dedicated to a private life, free from business and from the necessity of applying themselves to other duties. But men should rather imitate the wisdom of jewellers, who, if there be a grain or a cloud or an ice in a jewel, which may be ground forth without taking too much of the stone, they remove it: otherwise they will not meddle with it. And in like manner men ought so to procure serenity, as they destroy not magnanimity. And so much for Individual good.

Having, therefore, discussed self-good (which we also term "*Private*," "*Particular*," and "*Individual*" good), let us resume the good of communion, which respects and beholds society, which we may term *Duty:* because the term of duty is more proper to a mind well framed and disposed towards others, as the term of virtue is applied to a mind well formed and composed in itself. This part may seem at first glance to pertain to science civil and politic, but not if it be well observed; for it concerns the regimen and government of every man over himself, and not over others. And as in architecture it is one thing to direct the framing the posts, beams, and other parts of the building, and another thing to join and fasten them; and as in

[1] Juv. x. 357.:—

Give me a soul which can grim death defy,
And count it Nature's privilege to die.

mechanics it is one thing to direct how to frame an instrument or engine, and another to set it on work and employ it; so the doctrine of the conjugation of men in the state or society, differs from that which teaches them to conform and be well-disposed to the advantages thereof.

This part of duty is likewise subdivided into two parts; whereof the one treats of "the common duty of every man" as a member of a state; the other treats of "the respective or special duties of every man, in his profession, vocation, rank and character." The first of these is extant, and well laboured, as has been said; the second likewise I may report as handled dispersedly, though not digested into an entire body of science; not that I object to this manner of dispersed writing, which on the contrary in this kind of argument I acknowledge to be best. For who is there with such clearness or confidence that he can take upon him to write skilfully and accurately of the proper and relative duty of every several vocation and place? But treatises on matters of this kind which do not savour of experience, but are only drawn from a general scholastic knowledge of the subject, are for the most part empty and unprofitable. For although sometimes a looker on may see more than a player, and there be a proverb more arrogant than sound, concerning the censure of the people on the actions of their superiors, "That the vale best discovers the hill;" yet it were much to be wished that only men of most practice and experience should meddle with such arguments; for the writing of speculative men on active matter for the most part seems to men of experience, as Phormio's arguments of the wars seemed to Han-

nibal, to be but dreams and dotage.[1] Only there is one vice which accompanies those who write on their own arts and professions, that they cannot refrain from adorning and magnifying in excess those little Sparta's of theirs.

In which kind it were inexcusable not to mention (honoris causâ) your Majesty's excellent book touching the duties of a king, a work richly compounded of many known and secret treasures of divinity, morality, and policy, with great aspersion of all other arts, and being in my opinion one of the most sound and healthful writings that I have read; not distempered in the heat of invention, nor chilled in the coldness of negligence; not subject to fits of dizziness, and so falling into confusion and disorder; not distracted by digressions, so as to embrace in a discursive narrative things impertinent to the purpose; not savouring of perfumes and paintings, as those do, who attend more to the pleasure of the reader than the nature of the argument; above all, being a book as good in spirit as in body, since it is both agreeable to truth, and apt for action. And it is moreover quite free from that vice which I have noted above (which, if it were tolerated in any, certainly it would be so in a king, writing of the authority of a king), seeing it does not exalt invidiously or above measure the height and summit of kingly power; for your Majesty has represented, not a king of Assyria, or Persia, in the glitter of outward pride and glory; but truly a Moses or a David, that is, shepherds of their people. Neither can I ever forget the observation so truly worthy of a king, which your Majesty delivered, in the same sacred spirit of govern-

[1] Cic. de Orat. lib. ii. 18.

ment, in deciding a great cause of judicature; which was, "That kings ruled by the laws of their kingdoms, as God did by the laws of Nature, and ought as rarely to put in use their supreme prerogative, as God does his power of working miracles." And yet, notwithstanding, in your other book of a free monarchy it well appears that you no less perceive and understand the plenitude of the power of a king, and the ultimities (as the schoolmen say) of regal rights, than the circle and bounds of his office and duty. Thus have I presumed to allege this excellent writing of your Majesty, as a prime or eminent example of treatises concerning special and respective duties; wherein I should have said as much if it had been written by any king a thousand years since. Nor am I moved with that rule of manners which is usually laid down, "that one should not praise in presence;" provided that the praise be not beyond the truth, and bestowed unseasonably, or without occasion. Surely Cicero, in that brilliant oration for Marcellus, was but exhibiting an excellent picture of Cæsar's praises, though he was speaking before his face. And the like did Pliny the younger to Trajan.

But to return to our purpose. There belongs further to the handling of this part, touching the respective duties of vocations and professions, a relative or opposite doctrine touching the frauds, cautions, impostures, and vices of every profession; for corruptions and vices are opposed to duties and virtues. And it is true that these are not altogether passed over, but there are many treatises and writings in which they are touched upon at least in passing; but how? rather in a satire, and cynically after the manner of Lucian,

than seriously and wisely. For men have rather sought by wit to traduce much that is good or useful in professions, and expose it to ridicule, than to discover and sever that which is vicious and corrupt. But Solomon says well, "A scorner seeks wisdom, and finds it not, but knowledge offers itself unto him that is desirous thereof;"[1] for he who comes to seek after knowledge with a mind to scorn and censure will be sure to find matter enough for his humour, but very little for his instruction. But the serious handling of this argument with integrity and sincerity ought, as it appears to me, to be reckoned among the best fortifications for honesty and virtue. For as the fable goes of the basilisk, that if he see you first, you die for it, but if you see him first, he dies; so is it with deceits, impostures, and evil arts, which, if they be first espied, they lose their life, but if they prevent, they endanger; so that we are much beholden to Machiavelli and other writers of that class, who openly and unfeignedly declare or describe what men do, and not what they ought to do. For it is not possible to join the wisdom of the serpent with the innocence of the dove, except men be perfectly acquainted with the nature of evil itself; for without this, virtue is open and unfenced: nay, a virtuous and honest man can do no good upon those that are wicked, to correct and reclaim them, without first exploring all the depths and recesses of their malice. For men of corrupted minds presuppose that honesty grows out of an ignorance or simplicity of manners, and believing of preachers, schoolmasters, books, moral precepts, common discourses, and opinions; so as, except they plainly perceive that you know

[1] Prov. xiv. 6.

as much of their corrupt opinions and depraved principles as they do themselves, they despise all honesty of manners and counsel; according to the excellent proverb of Solomon, "The fool receives not the word of the wise, unless thou speakest the very things that are in his heart."[1] But this part, touching respective cautions and vices, we set down as deficient, and will call it by the name of "*Serious Satire*," or the *Treatise of the Inner Nature of Things*.

Unto this part, touching respective duty, do also appertain the mutual duties between husband and wife, parent and child, master and servant; so likewise the laws of friendship and gratitude, the civil bonds of companies, colleges, neighbourhood, and the like; but it must ever be kept in mind, that they are here handled, not as they are parts of civil society (for that is referred to policy), but as to the framing and predisposing of the minds of particular persons towards the preservation of those bonds of society.

The knowledge concerning good respecting Society (as well as that which respects Individual good) handles it not simply alone, but comparatively; whereunto belongs the weighing of duties between person and person, case and case, particular and public, present and future; as we see in the stern and severe proceeding of Lucius Brutus against his own sons, how it was generally extolled to the sky; and yet what did another say of it? "It was an unhappy deed, whatever posterity might say of it."[2]

And we see the same in that supper to which Marcus Brutus, Caius Cassius, and others were invited.

[1] Prov. xviii. 2.

[2] Virg. Æn. vi. 823.: Infelix, utcumque ferent ea facta minores.

When to make trial of their opinions touching the intended murder of Cæsar, the question was cunningly raised, "whether the killing of a tyrant were lawful," they were divided in opinion; some holding that it was clearly lawful, for servitude was the extreme of evils; others, not so, for tyranny was better than a civil war; while a third set affirmed, according to the doctrine of Epicurus, that it was unfit for wise men to endanger themselves in the cause of fools.[1] But there are a number of like cases of comparative duties; amongst which, that is most frequent where the question is, whether injustice may be committed in order to save one's country, or for some great future advantage of that kind; touching which, Jason of Thessaly used to say, "Some things must be done unjustly, that many may be done justly."[2] But the reply is good; "Present justice is in your power, for that which is to come you have no security." Men must pursue things which are good and just at present, leaving the future to the Divine Providence. And so much for the knowledge touching the exemplar and description of good.

[1] Plutarch in Brut.

[2] Plut. Reip. ger. Princip. 817.

CHAP. III.

The Division of the Doctrine concerning the Culture of the Mind, into the Doctrine concerning the Characters of the Mind, the Affections, and the Remedies or Cures.—An Appendix of this same Doctrine, touching the Congruity between the Good of the Mind and the Good of the Body.

Now therefore that I have spoken of the fruit of life (understanding it in a philosophical sense), it remains to speak of the husbandry which belongs thereto; without which the former part seems to be no better than a fair image or statue, which is beautiful to contemplate, but is without life and motion; whereunto Aristotle eloquently subscribes in these words, "It is necessary then to speak of virtue, both what it is, and whence it proceeds, for it were almost useless to know what virtue is, but to be ignorant of the ways and means of acquiring it; therefore we must inquire not only to what kind virtue belongs, but also how it may be obtained; for we wish both to be acquainted with the thing itself, and to gain possession of it; wherein we shall not fully succeed, unless we know both the whence and the how."[1] In such express words and with such iteration does he inculcate this part, although he does not himself pursue it. This likewise it is which Cicero bestows on Cato the younger as no ordinary praise; that he had applied himself to philosophy, "not for the sake of disputing as most do, but for the sake of living according to its rules."[2] And although through the negligence of our times, wherein few men take any care touching the cultivation and disposition

[1] Magn. Mor. lib. i. 1. [2] Pro Murænа, c. 30.

of the mind, and the framing of their life to any fixed rule, (as Seneca[1] excellently says, "Everyone takes thought about the parts of life, no one about the whole:") this part may seem superfluous, yet I will not on that account pass it by untouched, but rather conclude with that aphorism of Hippocrates, "That they who are sick and feel no pain are sick in their mind;"[2] they need medicine not only to assuage the disease, but to awake the sense. And if it be objected that the cure of men's minds belongs to sacred divinity, it is most true; but yet moral philosophy may be admitted into the train of theology, as a wise servant and faithful handmaid to be ready at her beck to minister to her service and requirements. For as the Psalm says, "That the eyes of the handmaid look perpetually to the hands of her mistress,"[3] and yet no doubt many things are left to the care and discretion of the handmaid; so ought moral philosophy to give a constant attention to the doctrines of divinity, and be obedient to them, and yet so as it may yield of itself within its own limits many sound and profitable directions.

This part therefore, when I recall the excellency thereof, I cannot but find exceeding strange that it is not yet reduced to written inquiry. Wherefore seeing I set it down among the deficients, I will according to my custom sketch out some of the heads and points thereof.

First therefore in this, as in all things which are practical, we ought to cast up our account what is in our power and what not; for the one may be dealt with by way of alteration, but the other by way of application only. The husbandman cannot command

[1] Sen. Ep. 71. [2] Aph. ii. 6. [3] Psalm cxxiii. 2.

either the nature of the soil or the seasons of the weather; no more can the physician either the natural temper and constitution of the patient, or the variety of accidents. Now in the culture of the mind and the cure for its diseases three things are to be considered: the different characters of dispositions, the affections, and the remedies; just as in the treatment of the body three things are observed; the complexion or constitution of the sick man, the disease, and the cure; but of these three, only the last is in our power, the two former are not. Yet the inquiry into things beyond our power ought to be as careful as into those within it; for the exact and distinct knowledge thereof is the groundwork of the doctrine of remedies, that they may be more conveniently and successfully applied; and we cannot fit a garment, except we first take measure of the body.

So then the first article of this knowledge is concerned with *the different characters of natures and dispositions.* And we are not here speaking of the common inclinations either to virtues and vices, or to disorders and passions, but of those which are more profound and radical. And in truth I cannot sometimes but wonder that this part of knowledge should for the most part be omitted both in Morality and Policy, considering it might shed such a ray of light on both sciences. In the traditions of astrology men's natures and dispositions are not unaptly distinguished according to the predominances of the planets; for some are naturally formed for contemplation, others for business, others for war, others for advancement of fortune, others for love, others for the arts, others for a varied kind of life; so among the poets (heroic,

satiric, tragic, comic) are everywhere interspersed representations of characters, though generally exaggerated and surpassing the truth. And this argument touching the different characters of dispositions, is one of those subjects in which the common discourse of men (as sometimes though very rarely happens) is wiser than books. But far the best provision and material for this treatise is to be gained from the wiser sort of historians, not only from the commemorations which they commonly add on recording the deaths of illustrious persons, but much more from the entire body of history as often as such a person enters upon the stage; for a character so worked into the narrative gives a better idea of the man, than any formal criticism and review can; such is that of Africanus and Cato the Elder in Livy, of Tiberius, and Claudius, and Nero in Tacitus, of Septimius Severus in Herodian, of Louis XI., King of France, in Philip de Comines, of Ferdinand of Spain, the Cæsar Maximilian, and the Popes Leo and Clement in Francesco Guicciardini. For these writers, having the images of those persons whom they have selected to describe constantly before their eyes, hardly ever make mention of any of their actions without inserting something concerning their nature. So some of the relations which I have met with touching the conclaves of the popes, present good characters of the Cardinals; as the letters of ambassadors do likewise of the councillors of princes. Wherefore out of these materials (which are surely rich and abundant) let a full and careful treatise be constructed. Not however that I would have these characters presented in ethics (as we find them in history or poetry or even in common discourse), in

the shape of complete individual portraits, but rather the several features and simple lineaments of which they are composed, and by the various combinations and arrangements of which all characters whatever are made up, showing how many, and of what nature these are, and how connected and subordinate one to another; that so we may have a scientific and accurate dissection of minds and characters, and the secret dispositions of particular men may be revealed; and that from the knowledge thereof better rules may be framed for the treatment of the mind.

And not only should the characters of dispositions which are impressed by nature be received into this treatise, but those also which are imposed on the mind by sex, by age, by region, by health and sickness, by beauty and deformity, and the like; and again, those which are caused by fortune, as sovereignty, nobility, obscure birth, riches, want, magistracy, privateness, prosperity, adversity, and the like. For we see that Plautus makes it a wonder to see an old man beneficent, "His beneficence is that of a young man."[1] St. Paul advising that severity of discipline should be used towards the Cretans ("Reproach them severely"), accuses the disposition of their country; citing the poet's censure, "the Cretans are always liars, evil beasts, slow bellies."[2] Sallust notes that it is usual with kings to desire contradictories, "the desires of kings, as they are violent, so are they generally changeable and often contrary to themselves."[3] Tacitus observes that honours and fortune more often alter men's dispositions to the worse than to the better; "Ves-

[1] Mil. Glor. iii. 1. 40. [2] Ep. Tit. i. 12.
[3] In Jugurth. c. 113.

pasian alone was changed for the better."[1] Pindar makes the observation that great and sudden good fortune for the most part defeats and enervates men's minds. "There be, that are not able to digest great prosperity."[2] The Psalm shows it is more easy to keep a measure in the enjoying of fortune, than in the increase thereof, "If riches increase, set not your heart upon them."[3] These observations and the like I deny not but are touched a little by Aristotle in his Rhetoric, and here and there in some other men's writings, but they have never been incorporated into moral philosophy, to which they principally appertain; no less than the knowledge of the diversity of grounds and moulds does to agriculture, and the knowledge of the diversity of complexions and constitutions does to medicine. It should be done however now, except we mean to follow the indiscretion of empirics, who minister the same medicines to all patients of every constitution.

Next in order is the *knowledge touching the affections and perturbations*, which are, as I have said, the diseases of the mind. For as the ancient politicians in popular states were wont to compare the people to the sea, and the orators to the winds; because as the sea would of itself be calm and quiet, if the winds did not move and trouble it; so the people would be peaceable and tractable if the seditious orators did not set them in working and agitation:[4] so it may be fitly said, that the mind in its own nature would be temperate and staid; if the affections, as winds, did not put it into tumult and perturbation. And here again I find it

[1] Tac. Hist. i. 50.
[2] Cf. Pind. Olymp. i. 88.
[3] Psalm lxii. 10.
[4] Cicero Pro Cluent. c. 49.

strange, that Aristotle should have written divers volumes of ethics, and never handled the affections, as a principal portion thereof; yet in his Rhetoric, where they are considered but collaterally and in a second degree (as they may be moved and excited by speech), he finds a place for them, and handles them acutely and well, for the quantity thereof. For it is not his disputations about pleasure and pain that can satisfy this inquiry: no more than he who should generally handle the nature of light can be said to handle the nature of particular colours; for pleasure and pain are to the particular affections, as light is to particular colours. Better pains, I suppose, had the Stoics taken in this argument, as far as I can gather by that which remains of them; but yet I conceive it was rather in subtlety of definitions than in any full and ample description. So likewise I find some particular writings of an elegant nature, touching some of the affections, as of anger, of tenderness of countenance, and some few others. But to speak the real truth, the poets and writers of history are the best doctors of this knowledge, where we may find painted forth with great life and dissected, how affections are kindled and excited, and how pacified and restrained, and how again contained from act and further degree; how they disclose themselves, though repressed and concealed; how they work; how they vary; how they are enwrapped one within another; how they fight and encounter one with another; and many other particularities of this kind; amongst which this last is of special use in moral and civil matters; how, I say, to set affection against affection, and to use the aid of one to master another; like hunters and fowlers who use to hunt

beast with beast, and catch bird with bird, which otherwise perhaps without their aid man of himself could not so easily contrive; upon which foundation is erected that excellent and general use in civil government of reward and punishment, whereon commonwealths lean; seeing those predominant affections of fear and hope suppress and bridle all the rest. For as in the government of states it is sometimes necessary to bridle one faction with another, so it is in the internal government of the mind.

I now come to those points which are within our own command, and have operation on the mind to affect and influence the will and appetite, and so have great power in altering manners; wherein philosophers ought carefully and actively to have inquired of the strength and energy of custom, exercise, habit, education, imitation, emulation, company, friendship, praise, reproof, exhortation, fame, laws, books, studies, and the like. For these are the things that rule in morals; these the agents by which the mind is affected and disposed; and the ingredients of which are compounded the medicines to preserve or recover the health of the mind, as far as it can be done by human remedies; of which number I will select some one or two, upon which to insist, as patterns of the rest. I will therefore make a few observations on *Custom and Habit.*

The opinion of Aristotle seems to me to savour of negligence and narrowness of contemplation, when he asserts that custom has no power over those actions which are natural; using for example, "that if a stone be thrown up a thousand times, it will not learn to ascend of itself; and that by often seeing or hearing we do not learn to see or hear the better." [1] For

[1] Nic. Eth. ii. 1.

though this principle be true in some things, wherein nature is peremptory (the reasons whereof we have not now leisure to discuss), yet it is otherwise in things wherein nature admits, within certain limits, intension and remission. For he might see that a tight glove will come on more easily with use; that a wand by use and continuance will be bent contrary to its natural growth, and after a while will continue in the same position; that by use of the voice it becomes stronger and louder; that by custom we can better bear heat and cold, and the like; which two latter examples have a nearer resemblance to the subject, than those instances which he alleges. But however it be, the more true it is that virtues and vices consist in habit, he ought so much the more to have taught the rules for acquiring or removing that habit; for there may be many precepts for the wise ordering of the exercises of the mind, as well as of the body; whereof I will recite a few.

The first shall be, that we beware we take not at the first either a greater or a smaller task than the case requires. For if too great a burden be imposed, in a diffident nature you discourage; in a confident nature you breed an opinion, whereby a man promises to himself more than he is able to perform, which produces sloth; and in both these natures the trial will fail to satisfy the expectation, a thing which ever discourages and confounds the mind. But if the tasks be too weak, progress will be much retarded.

The second precept shall be, that to practise any faculty by which a habit may be acquired, two several times should be observed: the one, when the mind is best disposed, the other when it is worst disposed; that

by the one, you may gain a great step, by the other, you may through strenuous exertion work out the knots and obstacles of the mind, and so make the middle times the more easy and pleasant.

The third precept shall be that which Aristotle mentions by the way. "To bear ever with all our strength, so it be without vice, towards the contrary extreme of that whereunto we are by nature inclined;"[1] as when we row against the stream, or straighten a wand by bending it contrary to its natural crookedness.

The fourth precept depends on that axiom, which is most true; that the mind is brought to anything with more sweetness and happiness, if that whereunto you pretend be not first in the intention, but be obtained as it were by the way while you are attending to something else; because of the natural hatred of the mind against necessity and constraint. Many other useful precepts there are, touching the regulation of custom; for custom wisely and skilfully conducted proves indeed, according to the saying, a second nature; but governed unskilfully and by chance it will be but an ape of nature, imitating nothing to the life, but bringing forth only that which is lame and counterfeit.

So, if we should handle books and studies and what influence and operation they should have upon manners, are there not divers precepts and directions of great profit appertaining thereunto? Did not one of the fathers,[2] in great indignation call poesy "the wine of demons," because it engenders temptations, desires, and vain opinions? Is not the opinion of Aristotle very wise and worthy to be regarded, "that young

[1] Nic. Eth. ii. 9.

[2] St. Augustine. Cf. Agrippa de Incert. c. 4.

men are no fit auditors of moral philosophy,"[1] because the boiling heat of their affections is not yet settled, nor tempered with time and experience? And to say the truth, does it not hereof come that those excellent books and discourses of the ancient writers (whereby they have persuaded unto virtue most effectually by representing her in state and majesty, and popular opinions against virtue as clad in parasites' cloaks, fit to be scorned and derided) are of so little effect towards honesty of life and amendment of evil manners, because they are not read and revolved by men in their mature and settled years, but confined almost to boys and beginners. But is it not true also that much less are young men fit auditors of matters of policy, till they have been thoroughly seasoned in religion, morality, and duty, lest their judgments be corrupted and made apt to think that there are no true and real differences of things; but all things are to be measured by utility and fortune; as the poet says: —

Prosperum et felix scelus virtus vocatur;[2]

and again,

Ille crucem pretium sceleris tulit, hic diadema;[3]

which the poets speak satirically and in indignation, but some books of policy speak seriously and positively. For so it pleases Machiavelli[4] to say, "That if Cæsar had been overthrown, he would have been

[1] Nic. Eth. i. 1.

[2] Senec. Herc. Fur. 251.: —

Successful guilt will borrow virtue's name.

[3] Juv. xiii. 105.: —

Success is all; and for the self-same thing,
One dies a felon, the other lives a king.

[4] Mach. Discorsi, i. 10.

more odious than ever was Catiline;" as if there had been no difference but in fortune alone between a very fury of lust and blood, and the most excellent spirit (his ambition reserved) of the unconverted world. And how necessary it is for men to be fully imbued with pious and moral knowledge before they take any part in politics we see from this; that they who are brought up from their infancy in the courts of kings and affairs of state scarce ever attain to a deep and sincere honesty of manners; how much less chance have they then, if to this be added the like discipline in books? Again, is there not a caution likewise to be given of the doctrines of moralities themselves, at least some kinds of them, lest they make men too precise, arrogant, and incompatible? as Cicero says of Marcus Cato, "The divine and noble qualities we see in him, be sure are his own; the defects which we sometimes find, proceed not from his nature, but from his instructors."[1] Many other axioms there are touching those properties which studies and books infuse into men's minds; for the saying is true, "that studies pass into manners,"[2] as may likewise be said of all those other points, of company, fame, laws, and the rest, which I a little before recited.

But there is a kind of culture of the mind, which seems yet more accurate and elaborate than the rest, and is built upon this ground; that the minds of all men are at some times in a state more perfect, and at other times in a state more depraved. The purpose therefore and intention of this practice is to cherish the good hours of the mind, and to obliterate and take forth the evil out of the calendar. The fixing of the

[1] Cic. Pro Murænâ, c. 29. [2] Ovid. Epist. xv. 83.

good has been practised by two means; vows or constant resolutions of the mind, and observances or exercises, which are not to be regarded so much in themselves, as because they keep the mind in continual duty and obedience. The obliteration of the evil can likewise be practised by two means; some kind of redemption or expiation of that which is past, and an inception or new account of life for the time to come. But this part seems clearly to belong to religion, and justly so; for all true and sincere moral philosophy, as was said before, is but a handmaid to religion.

Wherefore I will conclude this part of the culture of the mind with that remedy, which is of all other means the most compendious and summary; and again the most noble and effectual to the reducing of the mind unto virtue, and placing it in the state nearest to perfection; which is, *the electing and propounding unto a man's self good and virtuous ends of his life and actions; such as may be in a reasonable sort within his compass to attain.* For if these two things be supposed, that a man set before him honest and good ends, and again that his mind be resolute and constant to pursue and obtain them, it will follow that his mind shall address and mould itself to all virtues at once. And this indeed is like the work of Nature; whereas the other courses I have mentioned are like the work of the hand. For as when a carver makes an image, he shapes only that part whereon he works, and not the rest (as if he be upon the face, that part which shall be the body is but a rude and unshaped stone still, till such time as he comes to it); but contrariwise, when Nature makes a flower or living creature, she forms and produces rudiments of all the parts at one time;

so in obtaining virtue by habit, while we practise temperance, we do not advance much in fortitude, nor the like; but when we dedicate and apply ourselves entirely to good and honest ends, what virtue soever the pursuit and passage towards those ends suggests and enjoins, we shall find ourselves invested with a precedent disposition and propensity to conform thereto. And this is the state of mind excellently described by Aristotle, and distinguished by him as having a character not of virtue but of divinity; his words are these: "To brutality we may not unaptly oppose that heroic or divine virtue which is above humanity;"[1] and a little after, "For as beasts are incapable of virtue or vice, so likewise is the Deity; for this latter state is something higher than virtue, as the former is somewhat other than vice." Again, Pliny the younger using the license of heathen grandiloquence sets forth the virtue of Trajan, not as an imitation, but rather as a pattern of the divine, where he says, "That men needed not to make any other prayers to the gods, but that they would show themselves as good and kind lords to them, as Trajan had been."[2] But these be heathen and profane passages, which grasp at shadows greater than the substance; but the true religion and holy Christian faith lays hold of the reality itself, by imprinting upon men's souls, Charity, which is excellently called "the bond of Perfection,"[3] because it comprehends and fastens all virtues together. And it is elegantly said by Menander[4] of sensual love (which is but a false imitation of divine love), "That love is a better teacher for human life than a left-handed soph-

[1] Nic. Eth. vii. 1.
[2] Pliny, Paneg. 1. c. 74.
[3] Coloss. iii. 14.
[4] Anaxandrides, not Menander.

ist," whereby he means that comeliness of manner is better taught by love than by a clumsy preceptor or sophist, whom he calls left-handed; because, with all his laborious rules and precepts he cannot form a man so dexterously, nor with that facility to prize and govern himself in all things, as love can do. So certainly if a man's mind be truly inflamed with charity, it raises him to greater perfection than all the doctrines of morality can do; which is but a sophist in comparison of the other. Nay further, as Xenophon truly observed, "that all other affections though they raise the mind, yet they distort and disorder it by their ecstasies and excesses, but only love at the same time exalts and composes it;"[1] so all the other qualities which we admire in man, though they advance nature, are yet subject to excess; whereas Charity alone admits of no excess. The Angels aspiring to be like God in power, transgressed and fell: "I will ascend, and be like unto the most High."[2] Man aspiring to be like God in knowledge, transgressed and fell: "Ye shall be as gods, knowing good and evil;"[3] but by aspiring to a similitude of God in goodness or love, neither angel or man ever transgressed or shall transgress; for unto that imitation we are called, "Love your enemies, bless them which hate you, and pray for them that despitefully use you and persecute you, that ye may be children of your Father who is in heaven, who makes his sun to rise on the evil and the good, and sends his rain on the just and the unjust."[4] So in the first platform of the divine nature itself, the heathen religion speaks thus, "Optimus Maximus," but the

[1] Xenoph. Sympos.
[2] Isaiah, xiv. 14.
[3] Gen. iii. 5.
[4] St. Matt. v. 44.

sacred Scriptures thus, "His mercy is over all His works."[1]

Here then I conclude this part of moral knowledge concerning the Georgics of the mind, wherein if any man, from viewing the parts thereof which I have enumerated, judge that my labour is but to collect into an art or science that which has been omitted by other writers as matter of common sense and experience, and sufficiently clear and self-evident, he is welcome to his opinion; but in the meanwhile let him remember that I am in pursuit, as I said at first, not of beauty but of utility and truth: and let him withal call to mind the ancient parable of the two gates of sleep: —

> Sunt geminæ Somni portæ, quarum altera fertur
> Cornea, qua veris facilis datur exitus umbris;
> Altera candenti perfecta nitens elephanto,
> Sed falsa ad cœlum mittunt insomnia Manes.[2]

Great no doubt is the magnificence of the ivory gate, but the true dreams pass through the gate of horn.

To these observations concerning moral philosophy may be added, *That there seems to be a relation or conformity between the good of the mind and the good of the body.* For as I said that the good of the body consisted of health, beauty, strength, and pleasure; so the good of the mind considered according to the precepts of moral knowledge tends to this; to make the mind sound and without perturbation; beautiful and graced with decency; and strong and agile for all the duties

[1] Psalm cxlv. 9.

[2] Virg. Æn. vi. 894.: —

> Two gates the entrance of Sleep's house adorn
> Of ivory one, the other simple horn;
> Through horn a crowd of real visions streams,
> Through ivory portals pass delusive dreams.

of life; lastly, not stupid, but retaining a lively sense of pleasure and comfort in an honest way. These three as in the body so in the mind seldom all meet together. For it is easy to observe that many have strength of wit and courage, who are yet disordered by perturbations and have little beauty and decency in their manners; some again have an elegance and fineness of carriage, who have neither honesty of will nor strength for action; and some again have honest and reformed minds, who can neither become themselves nor manage business: while others, though perhaps endowed with all these three, yet from a Stoical severity and insensibility have no pleasure in the virtuous actions which they practise. But though it happen that of these four two or three of them sometimes meet, yet the meeting of them all is, as I have said, very rare. I have now handled that general part of human philosophy which contemplates man as he consists of body and spirit, but segregate and apart from society.

OF

THE ADVANCEMENT OF LEARNING.

BOOK VIII.

CHAPTER I.

The Division of Civil Knowledge into the Doctrine concerning Conversation, Negotiation, and Empire or State Government.

THERE is an old story, most excellent king, that many philosophers being met together in the presence of the ambassador of a foreign prince, each endeavouring to give a sample of his wisdom, that the ambassador might be able to make a report of the wonderful wisdom of Greece; one of them remained silent and propounded nothing; insomuch that the ambassador turning to him, said, "What have you to say for me to report?" To whom he answered, "Tell your king that you have found a man in Greece, who knew how to hold his tongue."[1] And in truth, in this synopsis of the arts I have forgotten to mention the art of silence, which (since it is commonly deficient) I will now teach by my own example. For since the course of the argument has now brought me down to that

[1] This story is told of Zeno. See Plut. de Garrulitate, and Diog. Laert. vii 24.

point, that I should presently handle the art of government; and since I am writing to so great a king who is such a master in that art, wherein he has been trained from his cradle; and since I cannot altogether forget what position I have held under your majesty; I thought that I should better approve myself by silence on such a matter before your majesty, than by speech. Cicero indeed makes mention not only of an art, but of a kind of eloquence in silence; for in one of his letters to Atticus, after relating a conversation between himself and another person on both sides of a subject, he writes, "Here I borrowed part of your eloquence, for I held my tongue."[1] Pindar again (whose peculiar gift it was to surprise men's minds with some striking expression, as with a magic rod), utters some such saying as this, "Silence sometimes says more than speech."[2] Wherefore in this part I have determined to be silent, or to be very brief, which is next thing to silence; but before I come to the arts of government, I must first make some observations touching the other parts of civil knowledge.

Civil knowledge is conversant about a subject, which of all others is most immersed in matter, and with most difficulty reduced to axioms. Nevertheless there are some circumstances to relieve this difficulty; for first, as Cato the Censor used to say of the Romans, "that they were like sheep, for that a man might better drive a flock of them, than one of them; for in a flock, if you could but get some few of them to go right, the rest would follow;"[3] so in that respect the duty of moral philosophy is more difficult than that of policy. Secondly, moral philosophy propounds to itself to im-

[1] Cic. Ep. ad Attic. xii. 42. [2] Pind. Nem. v. 32. [3] Plut. in Cato, c. 8.

bue and endow the mind with internal goodness; but civil knowledge requires only an external goodness, for that suffices for society. And therefore it often comes to pass that there be evil times in good governments; as in the sacred history we find it said more than once in speaking of good and pious kings, "Howbeit the people had not yet directed their heart aright to the Lord God of their Fathers;"[1] wherefore in this respect also the office of moral philosophy is more difficult. Thirdly, states as great engines are moved slowly and not without great efforts, whence they are not so soon put out of frame; for as in Egypt the seven good years sustained the seven bad, so in states the good government of previous years prevents the errors of succeeding times from causing immediate ruin; but the resolutions and morality of particular persons are more suddenly subverted. And this makes moral knowledge more difficult, but civil knowledge more easy.

Civil knowledge has three parts, according to the three summary actions of Society; *the knowledge of conversation*, *the knowledge of negotiation*, and *the knowledge of empire or government*. For there are three kinds of good which men seek in society, comfort against solitude, assistance in business, and protection against injuries; and they are three wisdoms of divers natures, which are often separate; wisdom of behaviour, wisdom of business, and wisdom of state.

The wisdom of conversation ought certainly not to be overmuch affected, but much less despised; for a wise management thereof has not only a grace and honour in itself, but an important influence in business

[1] 2 Chron. xx. 33.

and government. For as action in an orator, though an external quality, is held of such account as even to be preferred to those other parts which appear more important and internal; so in a man of business conversation and the management thereof, though employed on external objects, finds, if not the highest, yet at all events an eminent place. For look what an effect is produced by the countenance and the carriage of it. Well says the poet,

Nec vultu destrue verba tuo.[1]

For a man may destroy and betray the force of his words by his countenance; nay, and the effect of his deeds also, if we believe Cicero; who in recommending to his brother affability towards the provincials, said that it did not so much consist in affording them easy access, as in receiving them with a courteous and open countenance. "It is nothing to have your door open, if your countenance be shut."[2] So we see Atticus before the first interview between Cæsar and Cicero, the war still depending, carefully and seriously advised Cicero touching the composing and ordering of his countenance and gesture.[3] And if the government of the face and countenance alone be of such effect; much more is that of the speech and other carriage appertaining to conversation. Indeed all grace and dignity of behaviour may be summed up in the even balancing of our own dignity and that of others, as has been well expressed by Livy, (though not meant for this purpose) in that description which he gives of personal character. "Lest I should appear (says

[1] Ovid, De Art. Am. ii. 312.: —

Let not your looks your words betray.

[2] De Petit. Cons.

[3] Cic. Ep. ad Att. ix. 12.

he) either arrogant or servile, whereof the one were to forget the liberty of others, the other to forget my own."[1] On the other side, if behaviour and outward carriage be intended too much, it may pass into a deformed and spurious affectation. "And then, what is more uncomely than to bring the manners of the stage into the business of life?" And even if it proceed not to that faulty extreme, yet too much time is consumed in these frivolous matters, and the mind is employed more than is right in the care of them. And therefore as in the universities preceptors use to advise young students from too much company keeping, by saying, "Friends are the thieves of time;" so certainly the constant attention of the mind to the discretion of the behaviour is a great thief of more serious meditation. Again such as are accomplished in urbanity, and seem as formed by nature for that alone, generally find satisfaction enough therein, and seldom aspire to higher and more solid virtue; whereas those who are conscious of a defect in this point seek comeliness by reputation; for where reputation is, there almost everything is becoming; but where that is not, it must be supplied by manners and behaviour. Again there is no greater nor more common impediment of action than an overcurious observance of external decency, and the attendant of decency, which is an anxious watching of Time and Season. For as Solomon well observes, "He that regards the winds does not sow, and he that regards the clouds does not reap:"[2] a man must make his opportunity as oft as find it. To conclude, this behaviour is as the garment of the mind, and ought to have the conditions of a

[1] Livy, xxiii. 12. [2] Eccles. xi. 4.

garment. For first, it ought to be made in fashion; secondly, it should not be too curious or costly; thirdly, it ought to be so framed, as to best set forth any virtue of the mind, and supply and hide any deformity; lastly, and above all, it ought not be too strait, so as to confine the mind and interfere with its freedom in business and action. But this part of civil knowledge touching conversation has been elegantly handled, and therefore I cannot report it for deficient.

CHAP. II.

The Division of the Doctrine concerning Negotiation into the Doctrine concerning Scattered Occasions and the Doctrine concerning Advancement in Life. — Example of the Doctrine concerning Scattered Occasions from some of the Proverbs of Solomon. — Precepts concerning Advancement in Life.

THE Doctrine concerning Negotiation is divided into *the Doctrine concerning Scattered Occasions*, and *the Doctrine concerning Advancement in Life;* whereof the one comprises all variety of business, and is as it were the secretary for the whole department of life; the other merely selects and suggests such things as relate to the improvement of a man's own fortune, and may serve each man for a private notebook or register of his own affairs. But before I descend to the species, I will make some preparatory remarks touching the doctrine concerning negotiation in general. The science of negotiation has not hitherto been handled in proportion to the importance of the subject, to the great

derogation of learning and the professors thereof. For from this root springs chiefly that evil, with which the learned have been branded; "*That there is no great concurrence between learning and practical wisdom.*" For if it be rightly observed, of the three wisdoms which we have set down to pertain to civil life, the wisdom of behaviour is by learned men for the most part despised, as a thing servile, and moreover an enemy to meditation. For wisdom of government, it is true that as often as learned men are called to the helm, they acquit themselves well, but that happens to few. But for the wisdom of business (of which I am now speaking), wherein man's life is most conversant, there are no books at all written of it, except some few civil advertisements collected in one or two little volumes, which have no proportion to the magnitude of the subject. For if books were written of this as of the other, I doubt not but learned men with but little experience would far excel men of long experience without learning, and outshoot them (as they say) in their own bow.

Neither is there any reason to fear that the matter of this knowledge should be so variable that it falls not under precept; for it is much less infinite than that science of government, which notwithstanding we see is excellently laboured and reduced. Of this kind of wisdom it seems some of the ancient Romans in the best times were professors: for Cicero reports that a little before his age senators who had most name and opinion for wisdom and practice in affairs (as Coruncanius, Curius, Lælius, and many others) used to walk at certain hours in the Forum, where they might give audience to their fellow-citizens, who would consult

with them not merely on subjects of law but on all sorts of business; as on the marriage of a daughter, the education of a son, the purchase of a farm, a contract, accusation, defence, and every other occasion incident to man's life.[1] Whence it appears that there is a wisdom of counsel and advice even in private causes, arising out of a universal insight and experience of the affairs of the world; which is used indeed upon particular causes, but is gathered by general observation of causes of like nature. For so we see in that book which Cicero wrote to his brother, "on Canvassing for the Consulship"[2] (being the only book of particular business that I know written by the ancients), although it especially concerned an action then on foot, yet it contained many politic axioms which prescribe not only a temporary but a perpetual direction in the case of popular elections. But of this kind there is nothing any way comparable to those Aphorisms composed by Solomon the King, of whom the Scriptures testify, "that his heart was as the sands of the sea;"[3] for as the sands of the sea encompass all the coasts of the earth, so did his wisdom embrace all things human as well as divine. But in these Aphorisms, besides those of a theological character, there are not a few excellent civil precepts and cautions, springing from the inmost recesses of wisdom and extending to much variety of occasions. Wherefore seeing I set down this knowledge of scattered occasions (which is the first part of the knowledge touching negotiation) among the deficients, I will stay awhile upon it according to my custom, and offer to consideration an example of the same, taken from the Aphorisms or Proverbs of Solomon.

[1] Cicero, De Orat. iii. 33. [2] De Petit. Consulatus. [3] 1 Kings, iv. 29.

Nor in my opinion can I be with reason blamed for seeking a politic meaning in one of the Sacred writers; for if those commentaries were extant which this same Solomon wrote touching the nature of things, (wherein he treated of every vegetable, from the moss upon the wall to the cedar of Lebanon, and likewise of all animals),[1] it would surely be lawful to interpret them in a natural sense; and therefore we may here use the same liberty in matters political.

An Example of a portion of the doctrine concerning scattered occasions, *taken from some of the Proverbs of Solomon.*

PROVERB.

(1.) A soft answer turneth away wrath.[2]

Explanation.

If the anger of a prince or a superior be kindled against you, and it is your turn to speak, Solomon gives two directions: first, "that an answer be made," and secondly, "that it be soft;" the former whereof contains three precepts. First, to beware of a sullen and obstinate silence, which either takes the fault entirely on yourself, as if you had no answer to make; or secretly impugns your superior of injustice, insinuating that his ears are not open to a defence, though a just one. Secondly, to beware of postponing the matter and demanding another time for defence; which either conveys the same impression as the preceding one, that your superior is carried away by too great an excitement of temper; or plainly intimates that having no answer ready you are meditating a false and

[1] 1 Kings, iv. 33. [2] Prov. xv. 1.

artificial defence. Wherefore it will ever be the best course to bring forward something in excuse directly as the occasion arises. Thirdly, that an answer at all events be made; not a simple confession or submission, but with a mixture of defence and excuse; for a different course is unsafe, except with very generous and noble characters, which are extremely rare. It follows in the other precept, that the answer be soft, not harsh or rough.

PROVERB.

(2.) A wise servant shall have rule over a foolish son, and shall have part of the inheritance among the brethren.[1]

Explanation.

In all disordered and discordant families there is ever some servant or humble friend of great influence, who acts as arbiter and settles their disputes, and to whom on that account both the whole family and the master himself are subject. Such a man, if he is pursuing his own interest, foments and aggravates the family feuds; but if he is truly faithful and upright he deserves a great reward; even to be counted as one of the brothers, or at least to have the direction of the inheritance in trust.

PROVERB.

(3.) If a wise man contend with a fool, whether he rage or laugh, he shall find no rest.[2]

Explanation.

We are often advised to avoid an unequal contest, meaning that we should not contend with those that

[1] Prov. xvii. 2. [2] Prov. xxix. 9.

are too strong for us. But the advice here given by Solomon is no less useful, "Not to contend with one that is unworthy;" for herein the chances are altogether unequal; seeing it is no victory to conquer, and a great disgrace to be conquered. And it makes no difference in this kind of contest, whether we take it in jest, or in scorn and contempt; for, whichever way we turn, we must lose in dignity and can no ways quit ourselves well of it. But the worst of all is if, as Solomon says, our adversary has somewhat of the fool in him, that is, if he be bold and presumptuous.

PROVERB.

(4.) Lend not thine ear to all words that are spoken, lest thou hear thy servant curse thee.[1]

Explanation.

It is scarcely credible what confusion is created in life by a useless curiosity about the things which concern us; that is, when we set to work to inquire into those secrets which when discovered produce uneasiness of mind, but are of no use to forward our designs. For first there ensues vexation and disquiet of mind, seeing all things human are full of treachery and ingratitude. And therefore if we could obtain a magic glass wherein we might view all the enmities and all the hostile designs that are at work against us, it were better for us to throw it down at once and break it to pieces; for these matters are but as the rustling of leaves, and have short duration. Secondly, this curiosity overcharges the mind with suspicions, a thing which ruins counsels, and renders

[1] Eccles. vii. 21.

them inconstant and perplexed. Thirdly, it often renders permanent those very evils which would otherwise blow over; for it is a dangerous thing to alarm the consciences of men; who, if they imagine themselves undetected, may come to a better mind; but if they perceive that they are discovered, they repel mischief with mischief. Rightly therefore was it considered great wisdom in Pompey that he burned all Sertorius's papers unperused either by himself or others.[1]

PROVERB.

(5.) Poverty comes as one that travelleth, and want as an armed man.[2]

Explanation.

It is elegantly described in this proverb, how the shipwreck of fortunes comes upon prodigals and those that are careless of their estates; for debt and diminution of capital come on at first slowly and step by step like a traveller, and are scarce perceived; but soon after want rushes in like an armed man, so strong and powerful as no longer to be resisted; for it was rightly said by the ancients, "that necessity was of all things the strongest."[3] Wherefore we must meet the traveller on his way, but against the armed man we must fortify.

PROVERB.

(6.) He that instructs a scorner gets to himself shame, and he that rebukes the wicked gets himself a blot.[4]

Explanation.

This agrees with the command of our Saviour, "not

[1] Plut. in Pomp. c. 20.; and in Sertor. c. 27.
[2] Prov. vi. 11. [3] Cf. Eurip. Helena. 513. [4] Prov. ix. 7.

to cast pearls before swine,"[1] but a difference is made between the actions of instruction and reproof; and also between the persons of the scorner and the wicked; and lastly, there is a difference in the return; for in the former case the labour is but lost, in the latter it is repaid with a stain and blot. For when a man informs and instructs a scorner, in the first place he loses his time; and secondly, the attempt is laughed at by others as a vain thing and labour misapplied; and lastly, the scorner himself despises the knowledge which he has received. But there is greater danger in the reproval of the wicked; for not only does a wicked man lend no ear to advice, but turns again on his reprover, whom being now made odious to him he either directly assails with abuse, or afterwards traduces to others.

PROVERB.

(7.) A wise son makes a glad father, but a foolish son is the heaviness of his mother.[2]

Explanation.

Here are distinguished the domestic comforts and tribulations of a father and mother respectively, touching their children. For a wise and prudent son is of most comfort to the father, who knows the value of virtue better than the mother, and accordingly has more joy in the virtuous inclination of his son; he may feel a satisfaction also in the course he has pursued, whereby he has brought up his son so well and implanted sound morality in him by precept and example. But the mother has most sorrow and discomfort at the ill fortune of her son, both because the affection of a

[1] St. Matt. vii. 6. [2] Prov. x. 1.

mother is more gentle and tender, and because she is conscious perhaps that she has spoiled and corrupted him by her indulgence.

PROVERB.

(8.) The memory of the just is blessed, but the name of the wicked shall rot.[1]

Explanation.

A distinction is here made between the character of the good and the bad after death. For when the envy which carped at the reputation of the good in their lifetime is quenched, their name forthwith shoots up and flourishes, and their praises daily increase; but for the wicked, though their reputation through the favour of their friends and partizans last for a time, yet soon it turns into contempt, and in the end their fleeting glory changes into infamy and as it were a foul and noxious odour.

PROVERB.

(9.) He that troubles his own house shall inherit the wind.[2]

Explanation.

A very useful admonition, touching domestic discords and disturbances. For many from the separation of their wives, the disinheriting of their children, the frequent changes in their family, promise to themselves great things; as if they would thence obtain peace of mind and a better management of their affairs; but commonly their hopes vanish into the winds. For both those changes generally turn out ill, and such disturbers of their family often experience trouble and

[1] Prov. x. 7. [2] Prov. xi. 29.

ingratitude from those whom to the neglect of others they select and adopt; nay further, they thus draw upon themselves ill reports and dishonourable rumours; for it is well said by Cicero, "Every man's reputation proceeds from those of his own household."[1] And both these evils Solomon elegantly expresses by "the inheritance of the winds;" for both the disappointment of expectation and the raising of rumours are not unaptly compared to winds.

PROVERB.

(10.) Better is the end of a speech than the beginning thereof.[2]

Explanation.

This proverb reproves a very common error, not only of those who make an especial study of words, but even of the more wise and prudent; which is, that men are more careful of the entrances and commencement of their speeches than of the end, and study more diligently the prefaces and inducements than the conclusions and issues; whereas for the former, they ought not indeed to neglect them, but the latter as being of far greater importance they ought to have ready prepared and arranged at hand; considering within themselves and endeavouring as much as possible to anticipate what shall be the end of their speech, and how their business may be advanced and ripened thereby. Nor is this all; for it is not only proper to study perorations and conclusions of such speeches as relate to the business itself, but also to be prepared with some discourse which may be conveniently and

[1] De Petit. Cons. 5.

[2] Eccles. vii. 8. The English version has, "Better is the end of a *thing*," &c.

gracefully thrown in at the close, although foreign to the matter in hand. Indeed I knew two great and wise councillors on whom the weight of business principally rested, with whom it was a constant care and especial art, whenever they conferred with their princes on matters of state, not to end their discourse with matters relating to the business itself, but always by way of divertissement to draw it away to some jest or some agreeable news, and so end by washing off (as the proverb has it) their salt water discourses with fresh.[1] Nor was this the least valuable of their arts.

PROVERB.

(11.) As dead flies do cause the best ointment to stink, so does a little folly him that is in reputation for wisdom and honour.[2]

Explanation.

It is a very hard and unhappy condition (as the Proverb well remarks) of men pre-eminent for virtue, that their errors, be they ever so trifling, are never excused. But as in the clearest diamond every little cloud or speck catches and displeases the eye, which in a less perfect stone would hardly be discerned; so in men of remarkable virtue the slightest faults are seen, talked of, and severely censured, which in ordinary men would either be entirely unobserved, or readily excused. Hence a little folly in a very wise man, a small offence in a very good man, a slight impropriety in a man of polite and elegant manners detracts greatly from their character and reputation; and therefore it would be no bad policy for eminent men to mingle

[1] Erasm. Adag. iii. 3. 26.

[2] Eccles. x. 1.

some harmless absurdities with their actions; so that they may retain some liberty for themselves, and make small defects less distinguishable.

PROVERB.

(12.) Scornful men bring a city to destruction, but wise men turn away wrath.[1]

Explanation.

It may seem strange that Solomon in his description of men formed as it were by nature for the ruin and destruction of states, should have selected the character, not of a proud and insolent, not of a tyrannical and cruel, not of a rash and violent, not of a wicked and impious, not of an unjust and oppressive, not of a seditious and turbulent, not of an incontinent and sensual, not finally of a foolish and incapable person, but the character of a scorner. And this selection is worthy of the wisdom of a king who well knew how states were overthrown or preserved; for there is hardly a greater danger to kingdoms and states than that councillors or senators and those who stand at the helm should be of a scornful disposition. For such men ever undervalue dangers, that they may appear bold councillors, and insult those who make a just estimate of them, as cowards. They sneer at seasonable delays and careful discussions in consultation and deliberation, as mere matter of oratory, full of weariness, and contributing nothing to the completion of business. As for reputation, with a view to which the counsels of princes ought to be specially framed, they despise it as the breath of the people, that will quickly be blown

[1] Prov. xxix. 8.

away. They make no more account of the power and authority of laws, than of cobwebs which ought not to be in the way of more important business. Counsels and precautions looking far into the future they despise as dreams and melancholy apprehensions. They scorn with gibes and jests men of real wisdom and experience, of great minds, and deep judgment. In short, they weaken all the foundations of civil government; a thing the more to be attended to, because the mischief is wrought, not openly, but by secret engines and intrigues; and the matter is not yet regarded by men with as much apprehension as it deserves.

PROVERB.

(13.) A prince who readily hearkens to lies, has all his servants wicked.[1]

Explanation.

When the prince is one who lends an easy and credulous ear without discernment to whisperers and informers, there breathes as it were from the king himself a pestilent air, which corrupts and infects all his servants. Some probe the fears and jealousies of the prince, and increase them with false tales; others excite in him passions of envy, especially against the most virtuous objects; others seek to wash away their own vileness and evil consciences by accusing others; others make way for the honours and wishes of their friends by traducing and calumniating their opponents; while others get up stage plots and a number of the like fables against their enemies. These are the machinations of servants who are of a more dishonest nature.

[1] Prov. xxix. 12.

But those also who are naturally of greater honesty and principle, when they find no safeguard in their innocence (the prince not being able to distinguish truth from falsehood), throw off their honesty, and catching the court breezes allow themselves to be carried where they blow. "For," as Tacitus says of Claudius, "there is no safety with that prince, who has nothing in his mind, but what others put into it."[1] And Comines well remarks, "It is better to be the servant of a prince whose suspicions have no end, than of one whose credulity has no measure."[2]

PROVERB.

(14.) A righteous man regardeth the life of his beast, but the tender mercies of the wicked are cruel.[3]

Explanation.

There is implanted in man by nature a noble and excellent spirit of compassion, that extends itself even to the brutes which by the divine ordinance are subject to his command. This compassion therefore has a certain analogy with that of a prince towards his subjects. Moreover it is most true, that the nobler a soul is, the more objects of compassion it has. For narrow and degenerate spirits think that these things concern them not; but the spirit which forms a nobler portion of the universe has a feeling of communion with them. Whence we see that under the old law there were many commandments, not so much purely ceremonial as institutions of mercy; as was that of not eating the flesh with the blood thereof, and the like. The Essenes and Pythagoreans even abstained altogether from eating

[1] Annals, xii. 3. [2] Histoire de Comines, i. 16. [3] Prov. xii. 10.

flesh: and the same superstition still prevails among some of the inhabitants of the Mogul Empire. Nay, the Turks, though by race and habits a cruel and bloody people, yet are wont to give alms to brute creatures, and cannot endure to see them ill used or tortured. But lest these things which we have mentioned should seem to countenance every kind of mercy, Solomon wisely adds, "That the mercies of the wicked are cruel." Such is the sparing to use the sword of justice upon wicked and guilty men; which kind of mercy is more cruel than cruelty itself; for cruelty is only practised upon individual persons, but this mercy to crime by granting impunity arms and lets loose upon the innocent the whole army of villains.

PROVERB.

(15.) A fool utters all his mind, but a wise man reserves something for the future.[1]

Explanation.

This proverb seems to be especially aimed not at the levity of foolish men, who with equal readiness let out what should be uttered, and what should be concealed; not at that plain speaking, with which they inveigh without discrimination and judgment against everybody and everything; not at that talkativeness, whereby they weary others *usque ad nauseam;* but at another fault which is less observed, namely, a method of discourse of all others most unwise and impolitic; I mean, when a man in private conversation so frames his discourse as to produce whatsoever he has to say pertinent to the matter in hand all at once and in a

[1] Prov. xxix. 11.

breath, without any stop or pause. Now this is a great impediment to business. For in the first place a speech that is broken and let fall part by part makes far more impression than a continuous one; because in the latter the matters touched are not distinctly and severally apprehended and weighed; and they have not time enough to settle; but one reason drives out another before it has taken firm hold. Secondly, no one is endowed with such powerful and persuasive eloquence as with the first stroke of his discourse to make his listeners dumb and speechless, but the other party will always have some answer to make, and will perhaps raise objections; and then it falls out, that the arguments which should have been reserved for refutation or reply, having being used and tasted beforehand, lose their strength and grace. Thirdly, if a man does not use all his arguments at once, but delivers them in parts, throwing in one after the other, he will detect by the countenance and answer of his opponent how each is taken, and what effect it produces, and he may thence take warning what to suppress and what to select in that which is to follow.

PROVERB.

(16.) If the spirit of the ruler rise up against thee, leave not thy place; for management pacifies great offences.[1]

Explanation.

This proverb directs a man how to behave when he has incurred the wrath and indignation of his prince, and contains two precepts; first, that he resign not his place; and secondly, that he carefully and prudently

[1] Eccles. x. 4.

apply himself to the remedy, as he would in the case of a serious disease. For generally, when men perceive the anger of princes stirred against them, partly through impatience of disgrace, partly that they may not by their presence irritate the wound, and partly that their princes may see their sorrow and contrition, they withdraw from their offices and appointments, nay sometimes they resign their places and dignities into his hands. But Solomon censures this remedy as injurious, and with good reason. For in the first place it makes the disgrace too public, whereby enemies and enviers become the bolder to attack, and friends the more timid to assist. Secondly, it thus happens that the anger of the prince, which if it had not been divulged might have died away of its own accord, is more deeply rooted and having as it were commenced by displacing the person proceeds to his overthrow. Lastly, this resignation savours somewhat of a malcontent spirit and one offended with the times, which aggravates anger with suspicion. The precepts for the remedy are these; first, let a man take care above all things neither by dullness on the one hand nor high spirit on the other to let it appear that he is insensible to the indignation of the prince, or not properly affected by it: that is, let him compose his countenance not to a sullen gloom but to a grave and modest sadness; and in all his duties and actions let him exhibit less cheerfulness and pleasure. It will be also advantageous for him to engage the assistance and mediation of some friend with the prince, who should take occasion at fit times to insinuate how deeply the offender is grieved. Secondly, let him carefully avoid all, even the slightest occasions, which may lead to the reopening of the sub-

ject of offence, or draw upon him fresh indignation or open rebuke, for whatever cause, from the prince. Thirdly, let him diligently seek for every occasion of making his services acceptable to the prince, that he may both show an anxious wish to redeem his past fault, and that the prince may perceive of how good a servant he will be deprived if he loses him. Fourthly, let him either contrive to transfer the fault to others, or insinuate that it was committed with no bad intention, or even let him point out the malice of those who complained of him to the king or exaggerated the matter more than it deserved. Lastly, let him be watchful in everything, and intent on the remedy.

PROVERB.

(17.) He that is first in his own cause is just, then comes the other side, and searches him.[1]

Explanation.

In every cause the first information, if it have dwelt for a little in the judge's mind, takes deep root and colours and takes possession of it; insomuch that it will hardly be washed out, unless either some clear falsehood be detected in the matter of the information, or some deceit in the statement thereof. A bare and simple defence, though it be just and of greater weight, will hardly counterbalance the prejudice of the first information, or restore to an equilibrium the scales of justice which have once inclined. Wherefore as it is safest for the judge to know nothing of the merits of the case till both parties are heard together, so it is the best course for the defendant, if he finds the judge

[1] Prov. xviii. 17.

prejudiced, to apply himself, as far as the case allows, to detect some fraud or deceit employed by the opposite party to abuse the judge.

PROVERB.

(18.) He that delicately brings up his servant from a child, shall afterwards find him insolent.[1]

Explanation.

According to the advice of Solomon, princes and masters ought to keep a measure in conferring grace and favour on their servants. In this three points are to be observed; first, that the promotion be by steps, and not by jumps; secondly, that they be accustomed to an occasional disappointment; and thirdly, as Machiavelli well advises, that they should have ever before their eyes some ulterior object of ambition.[2] Otherwise princes will be requited by their servants with disrespect and contumacy instead of duty and gratitude; for sudden promotion begets insolence; continual obtaining of desires begets impatience of refusal; and if there be nothing further to aspire to, there will be an absence of alacrity and industry.

PROVERB.

(19.) Seest thou a man swift of despatch? he shall stand before kings, and shall not be reckoned among the mean.[3]

Explanation.

Of all the qualities which kings especially look to

[1] Prov. xxix. 21. The English version has, "Shall have him become his son at the length."

[2] Cf. Mach. Il Princ. 22.

[3] Prov. xxii. 29.

and require in the choice of their servants, that of despatch and energy in the transactions of business is the most acceptable. Men of deep wisdom are objects of jealousy to kings, as being too close observers, and being able to use their abilities as an engine to turn and wind their masters against their will and knowledge. Popular men are disliked as standing in the light of kings and drawing the eyes of the people upon themselves. Men of great spirit and courage are often accounted turbulent and over-daring. Men of honour and integrity are reputed unmanageable and not pliant enough to all their masters' commands. Lastly, there is no other virtue which does not present some shadow of offence to the minds of kings. Expedition in the execution of their commands is the only one which contains nothing that is not acceptable. Moreover the minds of kings are hasty and impatient of delay; for they imagine that they have power to do what they will; all they want is, that it be done quickly; whence of all things despatch is most pleasing to them.

PROVERB.

(20.) I considered all the living which walk under the sun, with the second child who shall rise in his stead.[1]

Explanation.

This proverb remarks upon the vanity of men, who are wont to crowd around the appointed heirs of princes. The root hereof is in that madness, deeply implanted by nature in human minds, of being too fond of their own hopes. For there is scarcely any one but takes more delight in what he hopes for than in what he has.

[1] Eccles. iv. 15.

Novelty also is very pleasing to man, and is eagerly sought after. Now in a prince's heir hope and novelty are combined. And this proverb implies the same as that which was said of old, first by Pompey to Sylla, and afterwards by Tiberius respecting Macro. "That there be more who worship the rising than the setting sun."[1] And yet princes are not much disturbed at this, nor do they care much for it, as neither Sylla nor Tiberius did; but they rather scorn the fickleness of mankind, and do not care to strive with dreams; and hope, as was said, is but the dream of a waking man.[2]

PROVERB.

(21.) There was a little city, and few men within it; and there came a great king against it, and built great bulwarks round against it, and besieged it. Now there was found in it a poor wise man, and he by his wisdom delivered the city, yet no man remembered that same poor man.[3]

Explanation.

This proverb notes the corrupt and ungrateful nature of mankind, who in distress and adversity have commonly recourse to the wise and active men, whom they formerly held in contempt; but as soon as the storm has passed over, they are found ungrateful to their preservers. Machiavelli might well make it a question, "Which was more ungrateful to their benefactors, a prince or a people?"[4] but meanwhile he implies that both are guilty of ingratitude. But the ingratitude of the prince or the people is not the only

[1] Tac. Ann. vi. 46., and Plut. in Pomp. c. 14. [2] Cf. Quintil. vi. 2. 30.
[3] Eccl. ix. 14, 15. [4] Macch. Discourse, i. 29.

cause of this; there is added the envy of nobles, who are secretly displeased with the issue though fortunate and prosperous, because it did not originate in themselves; whence they both depreciate the merit of the work, and depress the author.

PROVERB.

(22.) The way of the slothful is as an hedge of thorns.[1]

Explanation.

This proverb very elegantly expresses the fact, that sloth is in the end laborious. Diligence and careful preparation remove the obstacles against which the foot would otherwise stumble, and smooth the path before it is entered; but he who is sluggish and defers everything to the last moment of execution, must needs walk every step as it were amidst briars and thorns, which catch and stop him. This likewise may be noted in the management of a family; wherein if care and forethought be used, everything goes on smoothly and of itself, without noise and discord; but if they be wanting, on any important emergency everything has to be done at once, the servants are in confusion, and the house in an uproar.

PROVERB.

(23.) To have respect of persons in judgment is not good; for, for a piece of bread will that man forsake the truth.[2]

Explanation.

This proverb most wisely marks that in a judge facility of disposition is more pernicious than bribery;

[1] Prov. xv. 19. [2] Prov. xxviii. 21.

for it is not every one that offers a bribe, but there is scarcely a case wherein something may not be found to bias the mind of the judge, if he be a respecter of persons. One man will be respected because he is popular; another because he has a shrewd tongue; another because he is rich; another because he is agreeable; another because he is recommended by a friend. In fine, where respect of persons prevails, there will be unequal measures everywhere, and for the most trifling reason, as it were for a morsel of bread, judgment will be perverted.

PROVERB.

(24.) A poor man that oppresses the poor, is like a sweeping rain, which causes famine.[1]

Explanation.

This proverb was anciently figured and represented under the fable of the full and hungry horseleech; for the oppression of a poor and hungry man is far more severe than that of a rich and full one, inasmuch as the former practises all the arts of exactions, and searches every corner for money. The same used also to be likened to a sponge, which when dry sucks in strongly, but not so when wet. And it contains a useful warning for princes and peoples; for princes, that they commit not offices or the government of provinces to needy persons and such as are in debt; for peoples, that they allow not their rulers to be too much in want of money.

PROVERB.

(25.) A righteous man falling down before the wicked is as a troubled fountain and a corrupt spring.[2]

[1] Prov. xxviii. 3. [2] Prov. xxv. 26.

Explanation.

This proverb teaches that an unjust and scandalous judgment in any conspicuous and weighty cause, is above all things to be avoided in a state; especially where it involves, not the acquittal of the guilty, but the condemnation of the innocent. For particular injuries passing unpunished do indeed trouble and pollute the waters of justice, but it is only in the streamlets; whereas unjust judgments, such as we spoke of, infect and corrupt the very fountain-heads. For when the judgment seat takes the part of injustice, there succeeds a state of general robbery, and men turn wolves to each other, according to the adage.[1]

PROVERB.

(26.) Make no friendship with an angry man, and walk not with a furious man.[2]

Explanation.

The more religiously the laws of friendship are to be observed and honoured among good men, the more care should be taken to make a prudent selection of friends at the first. Now the disposition and manners of our friends, so far as they affect ourselves only, should by all means be borne with; but when they compel us to alter our bearing and deportment towards other men, the condition of the friendship becomes very hard and unfair. Wherefore, as Solomon advises, it is of the first importance for the peace and security of life to have no dealings with passionate men, or such as easily engage in disputes and quarrels; for

[1] Erasm. Adag. i. 1. 70. [2] Prov. xxii. 24.

they will perpetually involve us in strife and faction, so that we shall be compelled either to break off our friendship, or disregard our own safety.

PROVERB.

(27.) He that covers a transgression seeks friendship, but he that repeats a matter separates very friends.[1]

Explanation.

There are two ways of making peace and reconciling differences; the one begins with an amnesty, the other with a recital of injuries, combined with apologies and excuses. Now, I remember that it was the opinion of a very wise man and a great politician, that "he who negotiates a peace, without recapitulating the grounds of difference, rather deludes the minds of the parties by representing the sweetness of concord, than reconciles them by equitable adjustment." But Solomon, a wiser man than he, is of a contrary opinion, approving of amnesty and forbidding recapitulation of the past. For in it are these disadvantages; it is as the chafing of a sore; it creates the risk of a new quarrel, (for the parties will never agree as to the proportions of injuries on either side); and lastly, it brings it to a matter of apologies; whereas either party would rather be thought to have forgiven an injury than to have accepted an excuse.

PROVERB.

(28.) In every good work there is abundance; but where there are many words there is commonly penury.[2]

[1] Prov. xvii. 9. [2] Prov. xiv. 23.

Explanation.

Herein Solomon makes a distinction between the fruit of the labour of the hand and that of the tongue; from the one proceeds abundance, from the other penury. For it generally happens that they who talk much, boast much, and make many promises, are needy persons, who make no profit of the things whereof they discourse. For the most part also they are no ways industrious and active in point of work, but merely feed and fill themselves with words, as with wind. Surely, as the poet says, "He that is silent is sure:"[1]—he who knows that he is succeeding in what he is about, is satisfied and holds his tongue; whereas he who feels that he has got hold of nothing but wind, betakes himself to talking and boasting.

PROVERB.

(29.) Open rebuke is better than secret love.[2]

Explanation.

This proverb rebukes the mistaken kindness of friends, who do not use the privilege of friendship freely and boldly to admonish their friends, as well of their errors as their dangers. "What can I do," says a man of this character, "or what steps can I take? I love him as much as any one, and if any misfortune were to befall him I would gladly substitute myself in his place; but I know his disposition well; if I deal freely with him I shall offend him, or at all events put him out of humour, and do no good by it; and I should sooner estrange him from his friendship for

[1] Ovid, Rem. Amor. 697. [2] Prov. xxvii. 5.

me, than from those things which he has fixed his heart upon." Now a friend of this sort Solomon reprehends as weak and useless, affirming that more advantage may be gained from an open enemy than from such a man; for a man may chance to hear by way of reproach from an enemy, what the friend is too good-natured to utter.

PROVERB.

(30.) A wise man looketh well to his ways, but a fool turneth to deceit.[1]

Explanation.

There are two kinds of wisdom; the one true and sound, the other degenerate and false, which Solomon does not hesitate to term folly. He who applies himself to the former takes heed of his own ways, foreseeing dangers, preparing remedies, employing the assistance of the good, guarding himself against the wicked, cautious in entering upon a work, not unprepared for a retreat, watchful to seize opportunities, strenuous to remove impediments, and attending to many other things which concern the government of his own actions and proceedings. But the other kind is entirely made up of deceits and cunning tricks, laying all its hopes in the circumventing of others, and moulding them to its pleasure; which kind the proverb denounces as being not only dishonest, but also foolish. For in the first place, it is not among the things which are in our own power, nor does it even depend on any certain rule; but fresh stratagems are daily to be contrived, as the old ones are used up and worn out. Secondly, a man who has once earned a

[1] Prov. xiv. 8. 15.

character for deceit and trickery, entirely loses one of the principal instruments of business, which is credit; whence he will find everything turn out otherwise than he expects. Lastly, these very arts, however fair and specious they may appear, generally fail: as Tacitus has well remarked, "Bold and crafty counsels are fair in promise, hard in execution, and unfortunate in issue." [1]

PROVERB.

(31.) Be not righteous overmuch, neither make thyself over wise; why shouldest thou destroy thyself before thy time.[2]

Explanation.

"There are seasons," says Tacitus,[3] "wherein great virtues are the surest causes of ruin." And upon men eminent for virtue and justice it comes sometimes suddenly, sometimes long foreseen. But if they have also the gift of wisdom, that is, if they are cautious and watchful for their own safety, they gain this advantage; that their ruin comes upon them all at once and entirely through dark and secret plots, whereby envy is avoided, and destruction assails them unawares. But with regard to that *overmuch* which the proverb speaks of, (as these are not the words of a Periander, but of Solomon, who, though he often takes notice of what is bad in human life, never enjoins it,) we must not understand it of virtue itself (in which there can be no overmuch), but of the vain and invidious affectation and show thereof. Something of the same kind is suggested by Tacitus in speaking of Lepidus; placing it in the light of a miracle that he never uttered a servile

[1] The words occur in Livy, xxxv. 32., and not in Tacitus.
[2] Eccles. vii. 16.
[3] Tac. Hist. i. 2.

opinion, and yet lived safely in such dangerous times: "The thought occurs to me," says he, "whether these things are controlled by fate, or whether it is in our power to steer an intermediate course between slavish obedience and abrupt contumacy, free alike from danger and from indignity."[1]

PROVERB.

(32.) Give opportunity to a wise man, and he will increase his wisdom.[2]

Explanation.

Here distinction is made, between the wisdom which is grown and ripened into a true habit, and that which floats only in the conceit of the brain, or is boasted in talk and has no deep root. The former, upon occasion presented for its exercise, is instantly excited, made alert, and enlarged, so that it appears greater than it was; but the latter, which before the occasion was eager and active, when the emergency occurs, becomes amazed and confused; so that even he who considered himself possessed of it, begins to doubt whether the notions he had formed of it were not mere dreams and idle speculations.

PROVERB.

(33.) He who praises his friend with a loud voice, rising early in the morning, it shall be counted a curse to him.[3]

Explanation.

Praises, when moderate and seasonable, and expressed on fit occasion, contribute greatly both to the

[1] Tac. Ann. iv. 20. [2] Prov. ix. 9. [3] Prov. xxvii. 14.

reputation and fortune of men; but when immoderate, noisy, and unseasonably lavished, they do no good; nay rather (if we believe the Proverb), they do great harm. For in the first place they openly betray themselves as either springing from excessive partiality, or got up and affected for the purpose of gratifying the object of them by false encomiums, rather than of honouring him with his just attributes. Secondly, sparing and moderate praises generally invite the audience to add something to them; whereas lavish and immoderate praises provoke them to take off and detract. Thirdly (which is the principal point), he that is overpraised becomes an object of envy; for all excessive praises seem to point to the reproach of others who are no less deserving.

PROVERB.

(34.) As the face is reflected in the water, so is the heart of man manifest to the wise.[1]

Explanation.

Here is distinguished beween the mind of a wise man, and that of others; the former being compared to water or a glass which represents the forms and images of things; the other to the earth, or an unpolished stone, which give no reflection. And this comparison of the mind of a wise man to a glass is the more proper; because in a glass he can see his own image together with the images of others, which the eye itself without a glass cannot do. But if the mind of a wise man is sufficiently large to observe and distinguish an infinite variety of dispositions and charac-

[1] Prov. xxvii. 19.

ters, it only remains to take care that the application be as various as the representation. "A wise man will know how to adapt himself to all sorts of characters." [1]

Thus have I stayed perhaps somewhat longer on these Proverbs of Solomon, than is agreeable to the proportion of an example, being led on by the dignity of the subject, and the renown of the author. Neither was this in use only with the Hebrews, but it is generally to be found in the wisdom of the ancients, that as men found out any observation which they thought good for life, they would gather it and express it in some short proverb, parable, or fable. Fables, as has been said elsewhere, were formerly substitutes and supplements of examples, but now that the times abound with history, the aim is more true and active when the mark is alive. And therefore the form of writing, which of all others is fittest for such variable argument as that of negotiation and scattered occasions, is that which Machiavelli most wisely and aptly chose for government; namely, Observations or Discourses upon Histories and Examples. For knowledge drawn freshly and in our view out of particulars knows best the way back to particulars again; and it contributes much more to practice, when the discourse or discussion attends on the example, than when the example attends upon the discourse. And this is not only a point of order, but of substance also. For when the example is laid down as the ground of the discourse, it is set down with all the attendant circumstances, which may sometimes correct the discourse thereupon made, and sometimes supply it, as a very pattern for imitation

[1] Ovid, De Arte Amat. i. 760.: —

Qui sapit innumeris moribus aptus erit.

and practice; whereas examples alleged for the sake of the discourse, are cited succinctly and without particularity, and like slaves only wait upon the demands of the discourse.

But it is worth while to observe this difference; that as Histories of Times are the best ground for such discourse upon governments, as Machiavelli handles; so Histories of Lives are the most proper for discourse on business, because they include all kinds of occasions and transactions, both great and small. Nay, we may find a ground for discourse on business fitter than them both, which is discourse upon such Letters as are wise and weighty, like those of Cicero to Atticus, and others; for letters have a closer and more lively representation of business, than either annals or lives. Thus have we spoken both of the matter and form of this first part of the knowledge of negotiation touching scattered occasions, which we note to be deficient.

But yet there is another part of this knowledge, which differs as much from that whereof we have spoken, as general wisdom differs from wisdom for oneself; the one moving as it were from the centre to the circumference, the other from the circumference to the centre. For there is a wisdom of imparting counsel to others, and there is a wisdom of foresight for one's own fortunes; and these sometimes meet, but oftener sever. For many are wise in their own ways, who yet are weak for government or counsel, like ants, which are wise creatures for themselves, but very hurtful for the garden. This wisdom for oneself the Romans, though excellent guardians of their country, took much knowledge of; "For," says the comic

poet, "a wise man fashions his fortune for himself."[1] And it grew into an adage amongst them, "Every man is the maker of his own fortune." And Livy attributes it to the elder Cato, "Such was his vigour of mind and understanding, that wherever he had been born, he would have made his fortune."[2]

This kind of wisdom, if it be too much declared and professed, has always been regarded as not only impolitic, but unlucky and ill-omened; as was observed in Timotheus the Athenian, who having done many great services to the state in his government, and giving the customary account thereof to the people, concluded every particular with this clause, "And in this fortune had no part."[3] But it happened that he never prospered in anything he took in hand afterwards; for this is too high and too arrogant, savouring of that which Ezekiel says of Pharaoh, "Thou sayest, my river is mine own, and I have made it for myself;"[4] or of that which Habakkuk says, "They exult and offer sacrifices to their net;"[5] or of that which the poet expresses of Mezentius the despiser of the gods: —

> Dextra mihi Deus, et telum quod missile libro
> Nunc adsint."[6]

Lastly, Julius Cæsar never, as far as I recollect, betrayed the weakness of his secret thoughts, except in a similar kind of speech. For when the augur brought him word that the entrails were not favourable, he murmured in a low voice, "They will be more favour-

[1] Plaut. Trinummus, ii. 2. 84.
[2] Livy, xxxix. 40.
[3] Plut. in Sylla, c. 6.
[4] Ezek. xxix. 3.
[5] Habak. i. 16.
[6] Virg. Æn. x. 773.: —

> My own right hand and sword assist my stroke,
> These gods alone Mezentius will invoke.

able when I choose;"[1] which speech did not long precede the misfortune of his death. For this excess of confidence was ever as unlucky as unhallowed; and therefore great and truly wise men have thought it right to ascribe their successes to their fortune, and not to their skill or energy. Thus Sylla surnamed himself "the Fortunate,"[2] not "the Great:" and Cæsar (better in this instance than the last) said to the master of the ship, "You carry Cæsar and his fortune."[3]

Nevertheless, proverbs such as these, "Every man is the architect of his own fortune;" "A wise man shall rule over the stars;" "No path is impervious to virtue;"[4] and the like; if taken and used as spurs to industry, and not as stirrups to insolence, rather to beget in men resolution and strength of judgment than arrogance or outward declaration, have ever been rightly held sound and good, and are doubtless imprinted in the greatest minds, so as sometimes they can scarce contain such opinions within; as we see in Augustus Cæsar, (who, compared with his uncle, was rather unlike than inferior, though decidedly a man of more moderation), how on his death-bed he desired his friends around him to give him a "Plaudite" when he expired, as if he were conscious to himself that he had well played his part in life.[5] This part of knowledge I report also as deficient; not but that it is used and practised even more than is fit, but it has not been handled in books. And therefore according to my custom, I will as before set down some heads or passages of it,

[1] Sueton. in Julio, c. 77.
[2] Plut. in Sylla, c. 6.
[3] Plut. de Roman. Fort. p. 319.
[4] Ovid, Met. xiv. 113.
[5] Sueton. in Aug. c. 99.

and call it the *Architect of Fortune, or the Knowledge of Advancement in Life.*

Wherein at first sight I shall appear to handle a new and unwonted argument, in teaching men how to raise and make their fortune; a doctrine indeed, wherein every man perchance will be ready to yield himself a disciple, till he has experience of the difficulty thereof. For the things necessary for the acquisition of fortune, are neither fewer nor less difficult nor lighter than those to obtain virtue; and it is as hard and severe a thing to be a true politician, as to be truly moral. But the handling hereof concerns learning greatly, both in honour and substance; in honour principally, that pragmatical men may not imagine that learning is like a lark, which can mount and sing and please itself and nothing else; but may know that it rather partakes of the nature of a hawk, which can soar aloft, and can also descend and strike upon its prey at pleasure. Again, it tends to the perfection of learning, because it is the perfect law of the inquiry of truth, "that nothing be in the globe of matter which has not its parallel in the globe of crystal or the understanding;" that is, that there be nothing in practice, whereof there is no theory and doctrine. Not however that learning admires or esteems this architecture of fortune otherwise than as an inferior work. For no man's fortune can be an end worthy of the gift of being that has been given him by God; and often the worthiest men abandon their fortunes willingly, that they may have leisure for higher pursuits. But nevertheless, fortune as an instrument of virtue and merit deserves its own speculation and doctrine.

To this doctrine are attached certain precepts, some

summary, and some scattered or various; whereof the former relate to the just knowledge of ourselves and others. Let the first precept then (on which the knowledge of others turns) be set down as this: that we obtain (as far as we can) that window which Momus required;[1] who seeing in the frame of man's heart such angles and recesses found fault that there was not a window to look into its mysterious and tortuous windings. This window we shall obtain by carefully procuring good information of the particular persons with whom we have to deal; their natures, their desires and ends, their customs and fashions, their helps and advantages, with their principal means of support and influence; so again their weaknesses and disadvantages, where they lie most open and obnoxious; their friends, factions, patrons and clients; their enemies, enviers, and competitors; their moods and times;

(Sola viri molles aditus et tempora noris):[2]

lastly, their principles, fashions, prescribed rules, and the like; and this not only of particular persons, but also of the particular actions which are on foot from time to time, and as it were under the anvil; how they are directed and succeed, by whom promoted or opposed, what is their weight and importance, what consequences they involve, and the like. For the knowledge of present actions is not only material in itself, but without it also the knowledge of persons will be very treacherous and erroneous; for men change with actions, and whilst they are involved and engaged in them they are one, and when they return to their na-

[1] Lucian in Hermotim. 20

[2] Virg. Æn. iv. 423.:—

His times of access you alone can find,
And know the soft approaches to his mind.

ture they are another. These informations of particulars touching persons and actions, are as the minor propositions in every active syllogism; for no truth or excellence of observations or axioms (whence the major political propositions are drawn) can suffice to ground a conclusion, if there be error in the minor proposition. For the possibility of this knowledge Solomon is our surety; who says, "Counsel in the heart of man is like deep water, but a man of understanding will draw it out."[1] And although the knowledge itself falls not under precept, because it is of individuals, yet the instructions for obtaining it may be laid down with advantage.

Knowledge of men may be derived and obtained in six ways; by their countenances and expressions, their words, their actions, their dispositions, their ends, and lastly, by the reports of others. With regard to the countenance, be not influenced by the old adage, "Trust not to a man's face;"[2] for though this may not be wrongly said of the general outward carriage of the face and action, yet there are some more subtle motions and labours of the eyes, mouth, countenance, and gesture, by which (as Q. Cicero elegantly expresses it), the "door of the mind,"[3] is unlocked and opened. Who more close than Tiberius Cæsar? Yet Tacitus, in noting the different character and manner of speaking which he employed in commending the exploits of Germanicus and Drusus to the Senate, says, that his praises of Germanicus were set forth "in words which appeared rather studied for outward effect, than as if he really felt them;" but of his praises of Drusus, he says, "that he said less, but

[1] Prov. xx. 5.

[2] Juv. ii. 8.:—Fronti nulla fides.

[3] De Pet. Cons. § 11.

spoke more earnestly and sincerely."[1] Again, Tacitus in speaking of this same Tiberius, and remarking on some speech, as being somewhat less ambiguous, says, "At other times he appeared to have a difficulty with his words, but he spoke more freely, when he took anybody's part;"[2] so that it is hard to find any man so skilled and perfect in the art of dissimulation, or any countenance so controlled or commanded (as he calls it) as to sever from a feigned and dissembling tale all these marks, and prevent the style from being either more careless, or more adorned, or more tedious and wandering, or more dry and hard, than usual.

As for words, though they be (as physicians say of waters) full of trickery and deceit, yet they are excellently detected in two ways; namely, either when they are spoken on the sudden, or in passion. Thus we see Tiberius, being suddenly incensed at some stinging words of Agrippina, and thrown a little off his guard, advanced a step out of his natural dissimulation. "These words (says Tacitus) drew from him a voice seldom heard from that dark bosom, and taking her up sharply, he reminded her in a Greek verse that she was thus offended, because she did not reign."[3] And therefore the poet elegantly calls passions, "tortures," which urge men to confess their secrets:

Vino tortus et irâ.[4]

And experience shows that there are very few men so true to their own secrets, and so settled in their purpose, but that sometimes through anger, sometimes through bravado, sometimes through affection for their

[1] Tacit. Ann. i. 52. [2] Ib. iv. 31. [3] Ib. iv. 52.

[4] Hor. Ep. i. 18. 38.: —

Tortured with wine and wrath.

friends, sometimes through a weakness of mind unable any longer to bear the burden of its thoughts, and sometimes through some other affection, they open and communicate their secret thoughts and feelings; especially if they be put to it with a counter-dissimulation according to the Spanish proverb, "Tell a lie, and find a truth."

Neither should deeds, though the most assured pledges which the human mind can give, be entirely trusted, without a judicious and careful consideration of their magnitude and nature. For the saying is most true, "that fraud begins by winning credit in small things, that it may deceive with greater advantage;"[1] and the Italian thinks himself upon the point of being bought and sold, if he is better used than he was wont to be, without manifest cause. For small favours do but quiet and lull to sleep men's caution and industry, whence they are rightly called by Demosthenes, "sops to feed sloth."[2] Again, the treacherous and ambiguous character of some deeds, even such as are taken for favours, may be seen from that deception which Mucianus practised on Antonius Primus; when after the hollow and unfaithful reconciliation which was made between them, he advanced many of the friends of Antonius to great offices: "At the same time he bestows on his friends tribuneships and governments;"[3] wherein, under pretence of strengthening Antonius, he entirely disarmed and isolated him by winning his friends.

But the surest key to unlock the minds of men, is by searching and thoroughly understanding either their

[1] Livy, xxviii. 42.

[2] Cf. Dem. Olynth. iii. 33., and 1 Philipp. towards the end.

[3] Tac. Hist. iv. 39.

natures and characters, or their intentions and ends; wherein the weaker and more simple sort are best interpreted by their natures, but the wiser and more reserved by their ends. For it was both pleasantly and wisely said, though I think very untruly, by a nuncio of the Pope, on his return from an embassy to a certain nation, where he had served as legate; who, when his opinion was asked touching the appointment of his successor, gave as his advice, "in no case to send one who was remarkably wise, but one rather of moderate abilities; because (said he) no very wise man would ever imagine what they in that country were likely to do." And certainly it is a very frequent error, especially among wise men, to measure others by the standard of their own genius, and to shoot over the mark, by supposing that men have deeper ends in view, and more subtle schemes than ever entered into their minds; as is elegantly expressed by the Italian proverb, which remarks, "There is always less money, less wisdom, and less faith, than men imagine." Wherefore in men of a meaner capacity, because they do many foolish things, we must form our opinion rather from the propensities of their natures, than from their designs and ends.

Princes also (though for a very different reason) are best interpreted by their natures, but private persons by their ends. For princes being at the summit of human desires, have for the most part no particular ends whereto they earnestly and constantly aspire, by their position and distance from which a measure and scale of the rest of their actions might be taken; and this is one of the principal causes why their hearts are (as the Scriptures declare) inscrutable.[1] But every

[1] Pro. xxv. 3.

private person is like a traveller striving earnestly to arrive at the end of his journey where he may rest; whereby it is not difficult to conjecture what he will do, and what he will not do. For if it be a means to his end he will probably do it; but if opposed to his end, he will probably not do it. Nor is it enough to inform ourselves only of the variety of men's natures and ends simply; but we should also examine them comparatively, and find what it is that predominates and directs the rest. Thus, we see, when Tigellinus saw himself outstripped by Petronius Turpilianus in providing pleasures and catering to Nero's humours, "he wrought" (says Tacitus) "on Nero's fears,"[1] whereby he displaced his rival.

As for the knowing of men at second hand from the reports of others, a few words will suffice. Men's weaknesses and faults are best known from their enemies, their virtues and abilities from their friends, their customs and times from their servants, their opinions and thoughts from their familiar friends, with whom they discourse most. General fame is light, and the judgments of superiors are not much to be trusted; for to them men are more masked. "The truest character comes from a man's own household."[2]

But to all this inquiry the most compendious way rests in three things; the first is to have a general acquaintance with those who have a varied and extensive knowledge both of persons and things; but especially to endeavour to have at least some particular friends who, according to the diversity of business and the diversity of persons, can give perfect and solid intelligence in every several kind. The second is to keep a discreet temper and mediocrity both in liberty of speech

[1] Tac. Ann. xiv. 57. [2] Q. Cicero, De Pet. Cons. 5.

and in secrecy; in most cases using liberty, but secrecy when the occasion requires it. For liberty of speech invites and provokes a similar liberty in others, and so brings much to a man's knowledge; but secrecy induces trust, so that men like to deposit their secrets there, as in their own bosom. The last is the gradual reducing of a man's self to such a watchful and ready habit of mind, that in every conference and action he may both carry on the matter in hand, and also observe other incidents. For as Epictetus lays down that a philosopher in every particular action should say to himself, "I both wish to do this, and also to keep to my rule:"[1] so a political man in everything should inwardly resolve, "I will both do this, and learn something more for future use." Wherefore those who are so intent and absorbed in the matter which they have in hand, that they have not even a thought to spare for anything that may turn up by the way (which Montaigne confesses to have been his weakness[2]), are indeed the best servants of kings and commonwealths, but fail in advancing their own fortunes. Meanwhile special care should be taken to restrain too great an energy and zeal of mind, lest by much knowledge we be drawn on to much meddling, than which nothing is more unfortunate and rash. So that this variety of knowledge of persons and things, which I recommend to be gained, returns in the end only to this, that we make a more judicious choice of the actions we undertake, and of the persons whose assistance we use; whereby we may manage and conduct everything with more safety and dexterity.

Next to the knowledge of others comes the knowl-

[1] Epict. Enchir. c. 9. [2] Cf. Essay De l'Utilité et de l'Honnetteté.

edge of self. And here, we must use even greater care in gaining good and accurate information touching ourselves, than touching others; since the oracle "know thyself" is not only a rule of universal wisdom, but has a special place in politics. For St. James says well, "That he who looks at his face in a glass, yet suddenly forgets what manner of man he was;"[1] so that there is need of very frequent inspection. And this holds good likewise in politics, though the glasses are different; for the divine glass in which we ought to behold ourselves is the Word of God, but the political glass is nothing else than the state of the world or times wherein we live.

Men ought therefore to take an accurate and impartial survey of their own abilities, virtues, and helps; and again, of their wants, inabilities, and impediments; making the account in such a manner that the former are always estimated rather more, and the latter rather less than they really are. From this examination they should frame the following considerations.

First, to consider how their natural and moral constitution sort with the general state of the times; which if they find agreeable and consonant, then in all things to give themselves more scope and liberty, and indulge their dispositions; but if there be anything differing and discordant, then in the whole course of their life to be more close, retired, and reserved. And this we see in Tiberius, who being conscious that his tastes did not well suit with the age, never attended the public games, and during the twelve last years of his life never even went into the Senate; whereas Augustus lived ever in men's eyes, which Tacitus ob-

[1] St. James, i. 23, 24.

serves: "Tiberius's habits (says he) were different." [1] Pericles also acted on the same principle.

Secondly, to consider how their nature sorts with the professions and courses of life which are in use and repute, and whereof they have to make election; so that if their profession is not already determined, they may make choice of that which is most fit and agreeable to their disposition; but if they have already entered on a path of life for which they are not naturally suited, that they may leave it the first opportunity, and adopt a fresh profession. And this we see was done by Valentine Borgia, who was brought up by his father to the priesthood, but afterwards quitted it in obedience to his own inclination, and betook himself to a military life; although equally unworthy of the office of prince and priest, seeing that he dishonoured both.[2]

Thirdly, to consider how they sort with their equals and rivals, whom they are like to have as competitors in their fortune; and to take that course of life wherein there is the greatest scarcity of distinguished men, and they themselves are likely to be most eminent. As Julius Cæsar did, who at first was an orator and pleader, and devoted himself entirely to a civil life; but when he saw how Cicero, Hortensius, and Catulus excelled in eloquence, and that there was no man of any great reputation in military matters but Pompey, he forsook the course he had begun, and bidding a long farewell to a civil greatness transferred his designs to the arts of a soldier and a general; whereby he mounted to the highest power of the state.

Fourthly, to consider their own nature and disposi-

[1] Tacit. Ann. i. 54.

[2] Guicciard. vi. 3.

tion in the choice of their friends and dependences. For different natures require different kinds of friends: to some is suited such as are solemn and silent; to others such as are bold and arrogant, and so on. And it is worthy of mark what kind of men the friends of Julius Cæsar were (namely, Antony, Hirtius, Pansa, Oppius, Balbus, Dolabella, Pollio, and the rest), who used to swear, "that they were ready to die, so Cæsar might live,"[1] displaying an infinite affection for Cæsar, but arrogance and contempt towards every one else; men active in the execution of business, but of no great character or reputation.

Fifthly, to take especial heed how they guide themselves by examples, and not vainly to endeavour to frame themselves upon other men's models; as if what is open to others must needs be open to them, not at all reflecting how far the nature and character of their models may differ from their own. And it was this error into which Pompey evidently fell, who, as Cicero has recorded, was so often wont to say, "Sylla could do this, why should not I?"[2] Wherein he was much deceived, the nature and proceedings of himself and Sylla being as far removed as the heaven from the earth; the one being fierce, violent, and in everything pressing on to the end; the other solemn, respectful of the laws, and regulating everything with a view to his dignity and character, which made him far less strong and effectual in accomplishing his designs. There are likewise other precepts of this nature, but these will be enough for an example of the rest.

But it is not enough for a man only to know himself; for he should consider also of the best way to set

[1] Plut. in Cæs. 3.

[2] Cic. Ep. ad Att. ix. 10.

himself forth to advantage; to disclose and reveal himself; and lastly, to turn and shape himself according to occasion. Now for the first we see nothing more usual than for the worse man to make the better external show. It is therefore no unimportant attribute of prudence in a man to be able to set forth to advantage before others, with grace and skill, his virtues, fortunes, and merits (which may be done without arrogance or breeding disgust); and again, to cover artificially his weaknesses, defects, misfortunes, and disgraces; dwelling upon the former and turning them to the light, sliding from the latter or explaining them away by apt interpretations, and the like. Tacitus says of Mucianus, the wisest and most active politician of his time, "That he had a certain art of setting forth to advantage every thing he said or did."[1] And it requires indeed some art, lest it become wearisome and contemptible; but yet it is true that ostentation, though carried to the first degree of vanity, is rather a vice in morals than in policy. For as it is said of calumny, "calumniate boldly, for some of it will stick," so it may be said of ostentation (except it be in a ridiculous degree of deformity), "boldly sound your own praises, and some of them will stick." It will stick with the more ignorant and the populace, though men of wisdom may smile at it; and the reputation won with many will amply countervail the disdain of a few. But if this self-display whereof I am speaking be carried with decency and judgment, as with a natural, candid, and ingenuous bearing; or if it be employed in times of danger, as by military persons in the time of war, or at times when others are most envied; or if what a

[1] Tac. Hist. ii. 80.

man says in his own praises appears to drop carelessly and unintentionally, without being dwelt upon too long or too seriously; or if a man at the same time that he praises does not refrain from ridiculing and finding fault with himself; or if he do it not spontaneously, but appears provoked and challenged to it by the reproaches and insolence of others, it adds greatly to his reputation. And surely no small number of those who are of a solid nature, and who from the want of this ventosity cannot spread all sail in pursuit of their own honour, suffer some prejudice and lose dignity by their moderation.

But for this enhancement of virtue, though some persons of weaker judgment and perhaps too scrupulous morality may disapprove of it, yet no one will deny that we ought at least to take care that virtue be not undervalued and unduly debased through neglect. This depreciation in the price of virtue may be effected in three ways: first, by a man offering and obtruding himself and his services in any business when he is unasked and uncalled for; wherein men think he is rewarded, if he be not rejected. Secondly, by doing too much at the commencement of an action, and by performing all at once what ought to be done by degrees; which in matters well managed procures a premature favour at first, but in the end induces satiety. Thirdly, by feeling too soon and easily the fruit of virtue in commendation, applause, honour, and favour, and being content therewith: on which there is a prudent warning, "Take care lest you appear unaccustomed to great things if you are thus delighted by a small thing, as if it were great."[1]

[1] Rhetor. ad Heren. iv. 4.

But a diligent covering of defects is of no less importance than a prudent and skilful display of virtues. Defects may be principally concealed in three ways, and as it were under three coverts; namely, caution, colour, and confidence. Caution is, when men discreetly avoid those things to which they are not equal; whereas contrariwise bold and unquiet spirits thrust themselves without reflection into matters of which they have no experience, and so publish and proclaim all their defects. Colour is, when men warily and skilfully make and prepare a way for themselves, for a favourable and convenient construction of their faults or wants; as proceeding from a better cause, or intended for some other purpose, than is commonly imagined. For as to the concealment of vice, it is well said by the poet, that "vice often hides itself in the neighbourhood of virtue." [1] And therefore, whatsoever want a man has, he must take care to borrow the mask and colour of the neighbouring virtue that shadows it; as if he be dull, he must affect gravity; if a coward, mildness; and so on. It will be of advantage also for a man to frame and spread abroad some probable reason why he shrunk from doing his best, that the want of power may be imputed to want of will. As to confidence, it is indeed an impudent, but yet the surest and most effectual remedy; namely, for a man to profess to depreciate and despise whatsoever he cannot obtain; after the principle of prudent merchants, whose business and custom it is to raise the price of their own commodities, and to beat down the price of others. But there is a confidence which surpasses this other in impudence; and this is, for a man to brazen

[1] Ovid, Art. Amat. ii. 662.: Sæpe latet vitium proximitate boni.

out his own defects, by putting them forward and displaying them to view; as if he believed himself especially eminent in those things wherein he is deficient. And the more easily to impose on others, he should appear to have least opinion of himself in those things wherein he is really the best: just as we see it is the practice of poets, who when they recite their verses, and you except to any, will immediately say, "that that line cost them more labour than any of the rest;" and presently they will bring forward some other verse, which they know well enough to be the best in the number and the least open to objection, and seeming to suspect it themselves they will ask your opinion of it. But above all, if a man means to make a good figure and maintain his just position in the world, I consider it of the greatest importance to him, not to show himself disarmed and exposed to scorn and injury by too much goodness and sweetness of nature; but rather in everything to exhibit from time to time some sparks of a free and noble spirit and one that carries with it no less of the sting than of the honey. This kind of fortified carriage, with a spirit ready and prepared to defend itself against insults, is sometimes accidentally forced upon men by something inherent in their person or fortune; as in the case of persons deformed, illegitimate, or disgraced. Whence men of this nature, if ability be not wanting, commonly turn out fortunate.

With regard to the disclosing of a man's self, it is a very different thing from the self-display of which I have been speaking. For it relates not to a man's virtues or faults, but to his particular actions in life; wherein there is nothing more politic for a man, than

to preserve a sound and wise mediocrity in declaring or concealing his meaning in particular actions. For although depth of secrecy and concealment of designs, and that manner of action, which effects everything by dark arts and methods (or *menées sourdes* as the French call them) be both useful and admirable; yet frequently, as is said, dissimulation breeds errors which ensnare the dissembler himself. Whence we see that the greatest and most noted politicians have not hesitated to declare freely and undisguisedly the objects which they had in view. So Lucius Sylla made open profession "that he wished all men happy or unhappy, as they stood his friends or enemies." So Cæsar, when he first went into Gaul, did not scruple to profess, "that he had rather be first in a village than second in Rome."[1] And again, as soon as he had begun the war, he by no means played the part of a dissembler, if we may judge by what Cicero says of him, "The other (meaning Cæsar) does not refuse, but rather demands to be called a tyrant, as he really is."[2] So we see in a letter of Cicero to Atticus, how little of a dissembler Augustus Cæsar was; for on his very entrance into public life, when he was still the darling of the senate, yet in his harangues to the people he would use this form of oath; "As I hope to attain to the honours of my parent;"[3] which was nothing less than the tyranny. It is true indeed that to lessen the envy of it, he would at the same time stretch forth his hand towards a statue of Julius Cæsar which was erected in the place; whereat men laughed, and applauded, and wondered, and said to one another, "What is this?

[1] Plutarch's Apopthegms. [2] Cic. Ep. ad Attic. x. 4.
[3] Cic. ad Attic. xvi. 15.

What sort of young man is this?" and yet thought a man could mean no mischief who spoke his feelings so openly and ingenuously. Now all these, whom I have mentioned, were prosperous; whereas Pompey, who tended to the same ends, but in a more dark and dissembling manner (as Tacitus says of him, "A more reserved, but not a better character;"[1] wherein Sallust concurs, "Of honest tongue and shameless mind"[2]), made it his design, and attempted by innumerable intrigues to keep his own ambition and desires quite secret, and in the mean time to drive the state into such anarchy and confusion that it should be forced of necessity to cast itself into his arms, and the sovereign power might thus be thrust upon him, apparently against his will and inclination. But when he had brought it, as he thought, to this point, when he was chosen sole consul (as no one had ever been before), yet was he no way nearer to his ends; because they who certainly would have assisted him did not understand what he wanted; so that in the end he was fain to go on the common and beaten track of procuring arms and raising an army under colour of opposing Cæsar; so tedious, uncertain, and mostly unfortunate are those designs which are concealed beneath a deep dissimulation. And this appears to have been the feeling of Tacitus, when he constitutes the artifices of dissimulation as a wisdom of an inferior form to the arts of true policy, attributing the former to Tiberius, but the latter to Augustus; for speaking of Livia, he says, "That she was equally suited to the arts of her husband, and the dissimulation of her son."[3]

[1] Tac. Hist. ii. 38. [2] Cf. Sueton. de Claris Grammaticis, c. 15.
[3] Tac. Ann. v. 1.

With regard to turning and shaping the mind, we must strive with all possible endeavour to render the mind obedient to occasions and opportunities, and to be noways obstinate and refractory towards them. For nothing hinders men's actions or fortunes so much as this, "to remain the same, when the same is unbecoming;"[1] that is, for men to be as they were, and follow their own nature, when occasions change: whence Livy, in introducing Cato the Elder, as a most skilful architect of his fortune, adds well of him, "That he had a wit that could turn."[2] This also is the reason why grave and solemn wits, which know not how to change, have generally more dignity than good fortune. But this viscous and knotty temper which is so averse to change is nature in some; in others it is the result of habit (which is a second nature), and an opinion (which easily steals into men's minds), namely, that men can hardly make themselves believe that they ought to change that course which they have found by experience to be prosperous and successful. For Machiavelli notes wisely, how Fabius Maximus would have retained to the last his old habit of temporising and protracting the war, when the nature of the war was altered and required more vigorous measures.[3] In others again the fault arises from weakness of judgment, that they do not discern in time when things or actions have reached a period, but come in too late, when the occasion has passed by; as Demosthenes says, when in reproving the Athenians he compares them to country fellows, who, in playing in the fencing school, when they have received a blow, always

[1] Cf. Cic. de Clar. Orat. c. 95.: Idem manebat neque idem decebat.
[2] Livy, xxxix. 40.
[3] Macch. Discorsi, iii. 9.

remove their shield to that ward, and not before.[1] In others again it is a dislike to lose their labours in the path which they have once entered, and an unwillingness to sound the retreat, with a confidence that by perseverance they will overcome the occasion. But from whatsoever root this stubbornness and restiveness of mind proceeds, it is a thing most prejudicial to man's actions and fortunes; and nothing is more politic than to make the wheels of the mind concentric and voluble with the wheels of fortune. And so much for the two summary precepts of this Architecture of Fortune; whereof the scattered precepts are numerous, but I will select a few for example's sake.

The first precept is that the carpenter of fortune should make a good use and a right application of his rule; that is, that he should accustom his mind to judge of the proportion and value of all things, as they conduce more or less to his fortune and ends, and that he do this substantially, not superficially. It is a thing strange, but true, that the logical part (if I may so term it) of many men's minds is good, but the mathematical part erroneous; that is, they can judge well enough of the consequences, but most unskilfully of the values of things; whence it happens that some take delight in private and secret converse with princes, others in popular fame and applause, supposing them to be things of great value; whereas in many cases they are full both of envy and peril. Others again measure things according to the labour and difficulty bestowed upon them, and think that if they be only moving they must needs advance and proceed; as Cæsar said ironically of Cato of Utica, when he de-

[1] Demosth. 1 Philipp. 46.

scribes how laborious and assiduous and indefatigable he was to no great purpose, "All these things he did with much earnestness."[1] Hence too it comes that men often deceive themselves, in thinking that if they procure the assistance of any man of worth and reputation, they are certain to succeed; whereas it is not the greatest but the fittest instruments that finish the work both quickest and best. Now for the true information of the mathematical part of the mind, it is worth while to know and have a description of what should be set down first for the raising and advancing of a man's own fortune, what second, and so on. First I set down the amendment of the mind; for the removing of impediments and working out the knots of the mind will sooner open the passage to fortune, than the obtaining of fortune will remove the impediments of the mind. In the second place I set down wealth and means, which many perhaps would have placed first, because of their great use in everything; but that opinion I may condemn, for the reason which Machiavelli gave in a case not much unlike. For whereas there was an old proverb, "that money is the sinews of war,"[2] yet he maintained on the contrary that the true sinews of war are nothing else than the sinews of a valiant and military people. And so in like manner it may be truly affirmed, that it is not money that is the sinews of fortune, but it is rather the sinews of the mind, wit, courage, audacity, resolution, temper, industry, and the like. In the third place, I set down character and reputation, the rather because they have certain tides and seasons, which if they be not taken in due time are difficult to be recovered, it being ex-

[1] Cæs. Bell. Civil. i. 30. [2] Mach. Discorsi, ii. 10.; et cf. Cicero, Philip. v.

tremely hard to restore a falling reputation. And lastly, I place honour, which is more easily won by any of the other three, much more by all combined, than if you begin with honour, and then proceed to the rest. But as it is of no little consequence to preserve order in matter, so it is of no less consequence to preserve order in time, the confusion whereof is one of the commonest errors; while men fly to their ends, when they should only be attending to their beginnings; and carelessly passing over the things which lie before them they rush at once to the highest and greatest of all; whereas it is a good precept, "Attend to present business."[1]

A second precept is to beware of being carried by an excess of magnanimity and confidence to things beyond our strength, and not to row against the stream. It is excellent counsel regarding men's fortunes, "Be ruled by the Fates and the Gods;"[2] for we ought to look round and observe where things lie open to us, and where they are closed and obstructed, where they are difficult and where easy, that we may not waste our strength on things to which convenient access is forbidden. For in this way we shall avoid repulse, not occupy ourselves too much about one matter, earn a character for moderation, offend fewer persons, and get the credit of continual success; whilst things which would perhaps have happened of themselves will be attributed to our industry.

The third precept seems to be somewhat repugnant to the former two, though not so if rightly understood. The nature of it is this, that we should not always

[1] Virg. Eclog. ix. 66.: Quod nunc instat agamus.
[2] Lucan, viii. 486.: Fatis accede Deisque.

wait for occasions, but sometimes challenge and induce them; and it is that to which Demosthenes alludes in high terms, "In the same manner as it is a received principle that the general should lead the army, so should wise men lead affairs, causing things to be done which they think good, and not themselves waiting upon events."[1] For if we diligently observe, we shall find two different kinds of sufficiency in performing actions and managing business. Some can make an apt use of occasions, but plot or invent nothing of themselves; others are wholly bent on their own plots, but cannot take advantage of accidental opportunities; either of which abilities without the other is very lame and imperfect.

A fourth precept is to undertake nothing which of necessity takes up a great quantity of time, but to have this sound ever ringing in our ears, "time is flying, time which cannot be retrieved."[2] And this is the reason why those who have devoted themselves to laborious professions and the like, as lawyers, orators, learned divines, and writers of books, are not so clever in founding and promoting their own fortunes; because their time is so much occupied with other things that they cannot investigate particulars, wait occasions, and devise and meditate on plots to advance their fortunes. Moreover, in the courts of princes and in commonwealths you will find that the ablest persons both to improve their own fortunes and to assail the fortunes of others are those who have no public duty to perform, but are ever occupied in this study of advancement in life.

[1] Demosth. Philip. i. 45.

[2] Virg. Georg. iii. 284.:

Sed fugit interea, fugit irreparabile tempus.

A fifth precept is to a certain degree to imitate nature, which does nothing in vain; no very difficult task, if a man will skilfully mix and interlace his several kinds of business. For in every particular action a man ought so to direct and prepare his mind, and should have one intention so underlying and subordinate to another, that if he cannot obtain his wishes in the best degree, he may yet be satisfied if he succeed in a second, or even a third; and if he cannot obtain them at all in that particular, then he may turn the labour spent in it to some other end besides the one intended; and if he cannot reap any fruit of it for the present, he may yet make it as a seed of somewhat in time to come; and if he can derive no substance from it either now or hereafter, he may try at all events to win some good opinion by it, or the like; by always exacting an account of himself, by which it may appear that each action and scheme has borne him some fruit more or less, and never allowing himself to stand amazed and confused, or to despond immediately that he fails to hit his chief mark. For nothing is more impolitic than to be entirely bent on one action. He that is so loses an infinite number of occasions, which indirectly fall out by the way, and are perhaps more proper and propitious for future use than for the present matter; wherefore men must be perfect in that rule, "These things ought ye to do, and not to leave the others undone."[1]

A sixth precept is not to engage oneself too peremptorily in anything, though at first sight it seem not liable to accident; but ever to have either a window open to fly out at, or a secret way to retire by.

[1] St. Matth. xxiii. 23.; St. Luke, xi. 42.

A seventh precept is that ancient precept of Bias, not construed to any point of perfidiousness, but only to caution and moderation, "Love as if you were some time to hate, and hate as if you were sometime to love;" for it utterly betrays and destroys all utility, for men to embark themselves too far in unfortunate friendships, troublesome and turbulent quarrels, or foolish and childish jealousies and emulations.

These will suffice for an example of the doctrine of advancement in life. I would however have it frequently remembered, that I am far from meaning that these sketches of things which I note as deficients should be set down as complete treatises, but only as shreds or fragments to serve as samples of the whole piece. Nor again am I so foolish as to assert that fortunes are not gained without all this contrivance which I have mentioned. For I well know they come tumbling into some men's laps; and that others only obtain them by simple diligence and attention, (using only a little caution,) without any great or laborious art. But as Cicero, in his portrait of a perfect orator, does not mean that every pleader should be or can be such; and again, as in the description of a prince or courtier by such as have handled those subjects, the model is always framed according to the perfection of the art, and not according to common practice; so likewise have I done in the description of a politic man, I mean politic for his own fortune.

But it must be remembered all this while, that the precepts which I have selected and set down on this subject are of that kind which may be called *Good Arts*. As for *Evil Arts*, if a man would propose to himself that principle of Machiavelli, "that virtue itself a man

should not trouble himself to attain, but only the appearance thereof to the world, because the credit and reputation of virtue is a help, but the use of it is an impediment;" or again, that other principle of his, "that a politic man should have for the basis of his policy the assumption that men cannot fitly or safely be wrought upon otherwise than by fear; and should therefore endeavour to have every man, as far as he can contrive it, dependent and surrounded by straits and perils;"[1] so that his politician would appear to be what the Italians call "A sower of thorns:" or that principle embodied in the verse quoted by Cicero, "Let friends fall, provided our enemies perish with them;"[2] as the Triumvirs did, who with the lives of their friends purchased the destruction of their enemies: or if he would be an imitator of L. Catiline, to set on fire and trouble states, that he may the better fish in muddy waters and make way for his own fortune; "For," said he, "if a fire be lighted in my fortunes, I will quench it, not with water, but with destruction:"[3] or if he would make his own that saying of Lysander, "that children are to be deceived with comfits, and men with oaths;"[4] with the like depraved and pernicious doctrines, whereof (as in all other things) there are a greater number than of the wise and good: if any one, I say, takes pleasure in such kind of corrupt wisdom, I will not certainly deny that (with these dispensations from all the laws of charity and virtue, and an entire devotion to the pressing of his fortune,) he may advance it quicker and

[1] Cf. Macch. Principe, c. 17, 18.
[2] Cic. pro Deiotaro, c. 9.
[3] Cic. pro Muræn. c. 25.; Sallust, Cat. c. 31.
[4] Plut. in Lysand. c. 8.

more compendiously. But it is in life as it is in ways, the shortest way is commonly the foulest and muddiest, and surely the fairer way is not much about.

But men ought to be so far removed from devoting themselves to wicked arts of this nature, that rather (if they are only in their own power, and can bear and sustain themselves without being carried away by a whirlwind or tempest of ambition) they ought to set before their eyes not only that general map of the world, "that all things are vanity and vexation of spirit," [1] but also that more particular chart, namely, "that being without well-being is a curse, and the greater being the greater curse;" and "that all virtue is most rewarded, and all wickedness most punished in itself;" as the poet excellently says: —

> Quæ vobis, quæ digna, viri, pro laudibus istis
> Præmia posse rear solvi? pulcherrima primum
> Dii moresque dabunt vestri.[2]

And so on the other hand, it is no less truly said of the wicked, "His own manners will be his punishment."[3] Secondly, men in projecting their schemes and diffusing their thoughts abroad on every side, in order to forecast and advance their fortunes, ought in the midst of these flights of the mind to look up to the Eternal Providence and Divine Judgment, which often overthrows and brings to nought the machinations and evil designs of the wicked however deeply laid; according to that Scripture, "He hath conceived mischief,

[1] Eccles. ii. 11.

[2] Virg. Æn. ix. 252.:

> Ye brave young men, what equal gifts can we,
> In recompense of such desert, decree?
> The greatest, sure, and best you can receive,
> The gods and your own conscious worth will give.

[3] Cic. Ep. ad Att. ix. 12.

and shall bring forth a vain thing."[1] Moreover, although men should refrain themselves from injury and evil arts, yet this incessant, restless, and as it were sabbathless pursuit of fortune leaves not the tribute which we owe to God of our time; who we see demands and separates for himself a tenth part of our substance, but a seventh of our time. For what advantage is it to have a face erected towards heaven, with a spirit perpetually grovelling upon earth, eating dust like the serpent? As the heathen also observed, "the particle of the Divine Spirit cleaves to the ground."[2] But if here any man flatter himself, that he will employ his fortune well, though he should obtain it ill; as was said concerning Augustus Cæsar, and Septimius Severus, "that either they should never have been born, or else they should never have died,"[3] they did so much mischief in their rise to greatness, and so much good when they were established; yet, let him bear in mind that such compensations of evil with good are to be approved after the evil is done, but that such counsels are to be condemned. Lastly, it will not be amiss for men, in this eager and excited chase of fortune, to cool themselves a little with that conceit which is elegantly expressed by the Emperor Charles the Fifth in his instructions to his son, "That fortune has somewhat of the nature of a woman, who, if she is too much wooed, is commonly the further off." But this last is only a remedy for those whose tastes are corrupted by a disorder of the mind. Let men rather build upon that foundation, which is as a corner

[1] Psalm vii. 14., or Job, xv. 35.
[2] Hor. Sat. ii. 2. 79.: Atque affigit humo divinæ particulam auræ.
[3] Aurelius Victor, Epit. c. 1. Lampridius de Severo.

stone both of Divinity and Philosophy, wherein they nearly agree as to that which ought to be sought first. For Divinity says, "Seek ye first the kingdom of God, and all these things shall be added unto you;"[1] and philosophy says something like it, "Seek ye first the good things of the mind, and the rest will either be supplied, or their loss will not be felt." And although the human foundation is sometimes built upon the sand, as we see in Marcus Brutus, when he brake forth into that speech at his death, —

Te colui, Virtus, ut rem; ast tu nomen inane es:[2]

yet the same foundation, laid by the hand of heaven, is ever laid upon the rock. Here then I conclude the doctrine concerning advancement in life, and with it the general doctrine concerning negotiation.

CHAP. III.

The Divisions of the Doctrine concerning Empire or Government are omitted; — An Introduction only is made to two Deficients; namely, the Doctrine concerning the Extension of the Bounds of Empire, and the Doctrine concerning Universal Justice, or the Fountains of Law.

I NOW come to the Art of Empire or Civil Government, which includes Œconomics, as a state includes a family. On this subject, as I before said, I have im-

[1] St. Matth. vi. 33.

[2] Cf. Dio Cassius, xlvii.:

Virtue I worshipped, and as real, sought,
But found her empty, and a thing of nought.

posed silence on myself, though perhaps I might not be entirely unqualified to handle such topics with some skill and profit, as being one who has had the benefit of long experience, and who by your Majesty's most gracious favour, without any merit of his own, has risen through so many gradations of office and honour to the highest dignity in the realm and borne the same for four whole years; and, what is more, being one who has been accustomed for eighteen successive years to the commands and conversation of your Majesty (whereby a very stock might be turned into a statesman), and who also, besides other arts, has spent much time in the study of laws and histories. All which I report to posterity, not through any vain boasting, but because I think that it is of no little importance to the dignity of literature, that a man naturally fitted rather for literature than for anything else, and borne by some destiny against the inclination of his genius into the business of active life, should have risen to such high and honourable civil appointments under so wise a king. But if my leisure time shall hereafter produce anything concerning political knowledge, the work will perchance be either abortive or posthumous. In the mean time, now that all the sciences are ranged as it were in their proper seats, lest so eminent a seat should be left entirely vacant, I have determined to mark as deficient only two parts of Civil Knowledge, which do not belong to the secrets of Empire, but have a wider and more common nature; and according to my custom I will set down examples thereof.

The Arts of Government contain three political duties; first, "the preservation," secondly, "the happiness and prosperity," and thirdly, "the extension,"

of empire. Of these the two former have in a great measure been excellently handled, but nothing has been said on the last. I will therefore set it down among the deficients, and according to custom, propose an example thereof, calling it "*the Statesman in Armour*," or the "*Doctrine concerning the Extension of the Bounds of Empire.*"

Example of a Summary Treatise touching the Extension of Empire.[1]

THE speech of Themistocles if applied to himself was certainly haughty and arrogant, but if generally applied to others it seems to contain both a wise observation and a severe censure. Desired at a feast to touch a lute, he said, "he could not fiddle, but yet he could make a small town a great city."[2] Now these words, transferred to a political meaning, excellently describe and distinguish two very different abilities in those that deal in business of state. For if a true survey be taken of the councillors, senators, and other public statesmen who have ever been, there will be found some, though very few, who can make a small city or kingdom great, and yet cannot fiddle; and on the other hand, there will be found many very cunning on the lute or lyre (that is, in the follies of courts), who yet are so far from having the power to make a small state great, that they appear rather to be naturally gifted to bring a great and flourishing state to ruin and decay. And certainly those degenerate arts and shifts, whereby many councillors and minis-

[1] This Latin treatise on the Extension of Empire is nearly an exact translation of the Essay on the True Greatness of Kingdoms. I have therefore retained the original English with very few alterations.

[2] Plut. in Them. 2.

ters often gain both favour with their masters and estimation with the people, deserve no other name than a certain knack of fiddling; being things rather pleasing for the time, and graceful to themselves only, than advantageous to the weal and advancement of the state, whereof they are ministers. There will no doubt be found other councillors and ministers, of no mean character, equal to their business, and able to govern the state well, so as to preserve it from manifest precipices and inconveniences, who nevertheless are far removed from the ability to raise and amplify an empire in power, means, and fortune.

But be the workmen what they may be, let us consider the work itself; that is, what is the true greatness of kingdoms and states and how it can be obtained. It is a subject indeed fit for princes to have ever in their hands and carefully to consider; to the end that neither by over-measuring their forces they may engage in vain enterprises beyond their power; nor on the other hand by undervaluing them they may demean themselves to timid and pusillanimous counsels.

The greatness of an empire as regards its size and territory falls under measure; as regards its revenue under computation. The number of the population may be taken by a census; the number and greatness of cities and towns by maps and surveys. But yet there is nothing among civil affairs more subject to error than the forming a true and right valuation of the power and forces of an empire. The kingdom of heaven is likened not to an acorn or any larger nut, but to a grain of mustard seed;[1] which is the smallest

[1] St. Matth. xiii. 31.

of all seeds, but yet has within itself a certain property and spirit hastily to get up and spread. So there are some kingdoms and states very great in extent of territory, and yet not apt to enlarge or command; and some that have but a small dimension of stem, and yet are apt to be the foundations of great monarchies.

Walled towns, stored arsenals and armouries, goodly races of horse, chariots of war, elephants, ordnance, artillery, and the like; all this is but a sheep in a lion's skin, except the breed and disposition of the people be stout and warlike. Nay, number itself in armies is not much advantage, where the people are of weak courage; for, as Virgil says, it never troubles the wolf how many the sheep be.[1] The army of the Persians in the plains of Arbela was such a vast sea of people, that it somewhat alarmed the commanders in Alexander's army; who came to him therefore and wished him to set upon them by night; but he answered, He would not pilfer the victory: and the defeat was easy.[2] When Tigranes the Armenian, being encamped upon a hill with four hundred thousand men, discovered the army of the Romans being not above fourteen thousand marching towards him, he made himself merry with it, and said, "Yonder men are too many for an embassage, and too few for a fight."[3] But before the sun set, he found them enough to give him the chase with infinite slaughter. Many are the examples of the great odds between number and courage; so that it may be set down as a sure and tried rule, that the principal point of greatness in any state is that the people itself be by race and disposition warlike. Nei-

[1] Virg. Ecl. vii. 52.
[2] Plut. in Alex. c. 31.
[3] Plutarch in Lucull. 27. and Appian, Bell. Mithrid. c. 85.

ther is money the sinews of war, as it is trivially said, where the sinews of men's arms in base and effeminate people are failing. For Solon said well to Crœsus, when in ostentation he showed him his gold, "Sir, if any other come that has better iron than you, he will be master of all this gold."[1] Therefore let any prince or state think soberly of his forces, except his militia of natives be of good and valiant soldiers. And let princes, on the other side, who have subjects of martial disposition, know their own strength, unless they be otherwise wanting unto themselves. As for mercenary forces, (which is the usual help in this case,) all examples show, that whatsoever state or prince rests upon them, he may spread his feathers for a time, but he will mew them soon after.

The blessing of Judah and Issachar will never meet; that the same people or nation should be both the lion's whelp, and the ass between burdens.[2] Neither will it be that a people over-laid with taxes should ever become valiant and martial. It is true that taxes levied by consent of the state do abate men's courage less; as it has been seen notably in the excises of the Low Countries; and, in some degree, in the subsidies of England. For you must note, that we speak now of the heart and not of the purse. So that although the same tribute and tax, laid by consent or by imposing, be all one to the purse, yet it works differently upon the courage. So that you may conclude that no people over-charged with tribute is fit for empire.

Let states that aim at greatness take heed that their nobility and gentlemen do not multiply too fast; for that makes the common subject grow to be a peasant

[1] Cf. Lucian's Charon. [2] Gen. xlix. 9. 14.

and base swain, driven out of heart, and in effect but the gentleman's labourer. Even as you may see in coppice woods; if you leave your staddles too thick, you will never have clean under-wood, but shrubs and bushes. So in countries, if the gentlemen be too many, the commons will be base; and you will bring it to that, that scarce one man in an hundred will be fit for an helmet; especially as to the infantry, which is the nerve of an army: and so there will be great population and little strength. This which I speak of has been nowhere better seen than by comparing of England and France; whereof England, though far less in territory and population, has been nevertheless an overmatch; and for this reason, that the yeomen and lower classes of England make good soldiers, which the peasants of France do not. And herein the device of King Henry the Seventh (whereof I have spoken largely in the history of his life) was profound and admirable: in making farms and houses of husbandry of a standard; that is, maintained with such a proportion of land attached inseparably to them, as may allow a subject to live in convenient plenty and no servile condition; and to keep the plough in the hands of the owners, or at least the tenants, and not mere hirelings. And thus indeed you shall attain to Virgil's character which he gives to ancient Italy:

Terra potens armis, atque ubere glebæ.[1]

Neither is that state, (which, for anything I know, is almost peculiar to England, and hardly to be found anywhere else, except it be perhaps in Poland,) to be

[1] Virg. Æn. i. 531.:

Hesperia called, a land divinely blessed,
Of strength in arms and fruitful soil possessed.

passed over; I mean the state of free servants and attendants upon noblemen and gentlemen, who are no ways inferior to the yeomanry as infantry. And therefore out of all question, the splendour and magnificence and great retinues and hospitality of noblemen and gentlemen received into custom conduce much unto martial greatness; whereas, contrariwise, the close and reserved living of noblemen and gentlemen causes a penury of military forces.

By all means it is to be looked to, that the trunk of Nebuchadnezzar's tree of monarchy[1] be great enough to bear the branches and the boughs; that is, that the natural subjects of the crown or state bear a sufficient proportion to the stranger subjects that they govern. Therefore all states that are liberal of naturalization towards strangers are fit for empire. For to think that an handful of people can, with the greatest courage and policy in the world, embrace too large extent of dominion, it may hold for a time, but it will fail suddenly. The Spartans were a difficult and jealous people in point of naturalization; whereby, while they kept their compass, they stood firm; but when they did spread, and their boughs were become too great for their stem, they became a windfall upon the sudden. Never was any state in this point so open to receive strangers into their body as were the Romans; therefore it sorted with them accordingly, for they grew to the greatest monarchy. Their manner was to grant naturalization, which they called the right of citizenship, and to grant it in the highest degree, that is, not only the right of commerce, the right of marriage, the right of inheritance; but also, the right of voting, and

[1] Daniel, c. iv.

the right of bearing office; and this not to single persons alone, but likewise to whole families; yea, to cities, and sometimes to nations. Add to this their custom of plantation of colonies, whereby the Roman plant was removed into the soil of other nations: and putting both constitutions together, you will say, that it was not the Romans that spread upon the world, but it was the world that spread upon the Romans: and that was the surest way of greatness. I have marvelled sometimes at Spain, how they clasp and contain so large dominions with so few natural Spaniards; but sure the whole compass of Spain is a very great body of a tree, far above Rome and Sparta at the first. And besides, though they have not had that usage to naturalize liberally, yet they have that which is next to it; that is, to employ, almost indifferently, all nations in their militia of ordinary soldiers; yea, and sometimes in their highest commands. Nay, it seems at this instant they are sensible of this want of natives and desire to remedy it; as appears by the pragmatical sanction published in this year.

It is certain that sedentary and within-door arts, and delicate manufactures (that require rather the finger than the arm,) have in their nature a contrariety to a military disposition. And generally all warlike people are a little idle, and love danger better than work; neither must they be too much broken off it, if they shall be preserved in vigour. Therefore it was great advantage in the ancient states of Sparta, Athens, Rome, and others, that they had the use of slaves who commonly dispatched those manufactures. But that is abolished in greatest part by the Christian law. That which comes nearest to it is to leave those arts chiefly

to strangers, who for that purpose are to be invited or at least easily received, and to contain the principal bulk of the vulgar natives within those three kinds; tillers of the ground, free servants, and handicraftsmen of strong and manly arts, as smiths, masons, carpenters, and the like; not reckoning professed soldiers.

But above all, for empire and greatness, it is of most importance that a nation profess arms as their principal honour, study, and occupation. For the things which we have formerly spoken of are but qualifications for the use of arms; and what is qualification without intention and act? Romulus after his death (as they report or feign), sent an injunction to the Romans, that above all they should attend to arms, and then they should prove the greatest empire of the world.[1] The fabric of the state of Sparta was wholly and carefully (though not wisely) framed and composed to that scope and end to make the people warriors. The Persians and Macedonians had it for a flash. The Britons, Gauls, Germans, Goths, Saxons, Normans, and others, had it for a time. The Turks have it at this day, (being not a little stimulated thereto by their law,) though in great declination. Of Christian Europe they that still have it are in effect only the Spaniards. But it is so plain that every man profits most in that to which he most attends, that it needs not to be stood upon. It is enough to point at it; that no nation, which does not directly profess arms and devote themselves to the practice thereof, may look to have any special greatness fall into their mouths. And on the other side it is a most certain oracle of time, that those states that continue long in that profession (as the Romans and Turks

[1] Livy, i. 16.

principally have done), do wonders in extension of empire: and those that have professed arms but for an age have notwithstanding commonly attained that greatness in that age which maintained them long after, when their profession and exercise of arms has grown to decay.

Incident to this point is for a state to have those laws or customs which may reach forth unto them just occasions or at least pretexts for making war. For there is that justice imprinted in the nature of men, that they enter not upon wars (whereof so many calamities do ensue), but upon some weighty, at the least specious, grounds and quarrels. The Turk has at hand for the cause of war the propagation of his law or sect; a quarrel that he may always command. The Romans, though they esteemed the extending the limits of their empire to be great honour to their generals when it was done, yet they never rested upon that alone to begin a war. First therefore, let nations that pretend to greatness have this, that they be quickly sensible of wrongs, either upon borderers, merchants, or public ministers; and that they sit not too long upon a provocation. Secondly, let them be prompt and ready to give aids and succours to their confederates and allies, as it ever was with the Romans; insomuch, as if the confederate had leagues defensive with divers other states, and upon invasion offered did implore their aids severally, yet the Romans would ever be the foremost and leave it to none other to have the honour. As for the wars which were anciently made on the behalf of a kind of party or tacit conformity of estate, I do not see how they may be well justified; as when the Romans made a war for the liberty of

Greece; or when the Lacedemonians and Athenians made wars, to set up or pull down democracies and oligarchies; or when wars were made by commonwealths and princes, under the pretence of justice or protection, to deliver the subjects of others from tyranny and oppression, and the like. Let it suffice for the present, that no estate expect to be great that is not awake upon any just occasion of arming.

No body can be healthful without exercise, neither natural body nor politic; and certainly to a kingdom or estate a just and honourable war is the true exercise. A civil war indeed is like the heat of a fever; but a foreign war is like the heat of exercise, and serves most of all to keep the body in health. For in a slothful peace both courage will effeminate and manners corrupt. But howsoever it be for happiness, without all question for greatness, it makes to be still for the most part in arms; and the strength of a veteran army (though it be doubtless a costly business), always on foot, is that which commonly gives the law, or at least the reputation amongst all neighbour states, as may be well seen in Spain; which has had, in one part or other, a veteran army almost continually, now by the space of six-score years.

To be master of the sea, is an abridgment of a monarchy. Cicero writing to Atticus of Pompey's preparation against Cæsar, says, "Pompey's counsel is plainly that of Themistocles, for he thinks that whoever is master of the sea is master of the empire."[1] And without doubt Pompey had tired out and reduced Cæsar, if upon vain confidence he had not left that way. We see the great effects of battles by sea from

[1] Cic. Ep. ad Att. x. 8.

many instances. The battle of Actium decided the empire of the world. The battle of Lepanto arrested the greatness of the Turk. There be certainly many examples where sea-fights have put an end to the war; but this is, when princes or states have risked their whole fortune upon the battles. But thus much is certain, that he that commands the sea is at great liberty, and may take as much and as little of the war as he will; whereas those that be strongest by land are many times nevertheless in great straits. Surely at this day with us of Europe the advantage of strength at sea (which is one of the principal dowries of this kingdom of Great Britain) is great; both because most of the kingdoms of Europe are not merely inland, but girt with the sea most part of their compass; and because the wealth and treasures of both Indies seem in great part but an accessory to the command of the sea.

The wars of latter ages seem to be made in the dark, in respect of the glory and honour which reflected upon men from the wars in ancient time. There be now for martial encouragement some degrees and orders of chivalry, which nevertheless are conferred promiscuously upon soldiers and no soldiers; and some remembrance perhaps upon the escutcheon, and some hospitals for maimed soldiers, and such like things. But in ancient times, the trophies erected upon the place of the victory, the funeral laudatives and monuments for those that died in the wars, the crowns and garlands personal, the style of emperor, which the great kings of the world afterwards borrowed, the triumphs of the generals upon their return, the great donatives and largesses to the soldiers upon the disbanding of the

armies, these, I say, and such like dazzling honours, were things able to inflame all men's courage and excite even the coldest breast; but above all, that of the triumph among the Romans was not a pageant or gaudery but one of the wisest and noblest institutions that ever was. For it contained three things, honour to the general, riches to the treasury out of the spoils, and donatives to the army. But that honour perhaps were not fit for monarchies, except it be in the person of the monarch himself or his sons; as it came to pass in the times of the Roman emperors, who did appropriate the actual triumphs to themselves and their sons for such wars as they achieved in person, and left only for wars achieved by subjects some triumphal garments and ensigns to the general.

To conclude: no man can, by taking thought, as the Scripture saith, "add one cubit to his stature"[1] in this little model of a man's body; but in the great frame of kingdoms and commonwealths it is in the power of princes or states to add amplitude and greatness to their kingdoms. For by wisely introducing such ordinances, constitutions, and customs, as we have now touched, and others like them they may sow greatness to their posterity and succession. But these counsels are commonly not observed, but left to take their chance.

Such then are the thoughts that now occur to me touching the extension of empire. But what avails this consideration, seeing that the Roman is supposed to have been the last of earthly monarchies? Yet because the extension of empire was set down as the last of the three political duties, I could not have passed

[1] St. Matth. vi. 27.; St. Luke, xii. 25.

it by altogether without deviating from my proposed course. There remains now the other of the two deficients which I mentioned; namely, the treatise of Universal Justice, or the Fountains of Equity.

All who have written concerning laws have written either as philosophers or lawyers. The philosophers lay down many precepts fair in argument, but not applicable to use: the lawyers, being subject and addicted to the positive rules either of the laws of their own country or else of the Roman or Pontifical, have no freedom of opinion, but as it were talk in bonds. But surely the consideration of this properly belongs to statesmen, who best understand the condition of civil society, welfare of the people, natural equity, customs of nations, and different forms of government; and who may therefore determine laws by the rules and principles both of natural equity and policy. Wherefore let it be my present object to go to the fountains of justice and public expediency, and endeavour with reference to the several provinces of law to exhibit a character and idea of justice, in general comparison with which the laws of particular states and kingdoms may be tested and amended. I will now therefore according to my custom set forth an example thereof in one of its heads.

Example of a Treatise on Universal Justice or the Fountains of Equity, by Aphorisms: one Title of it.

PREFACE.

APHORISM 1.

In Civil Society, either law or force prevails. But there is a kind of force which pretends law, and a

kind of law which savours of force rather than equity. Whence there are three fountains of injustice; namely, mere force, a malicious ensnarement under colour of law, and harshness of the law itself.

APHORISM 2.

The ground on which private right rests is this. He who commits an injury, receives either pleasure or profit from the act, but incurs danger from the precedent. For others do not share in the particular pleasure or profit, but look upon the precedent as concerning themselves. And hence they readily agree to protect themselves by laws, that the course of injury may not come round to them in turn. But if through the state of the times, and a communion of guilt, it happen that those whom a law protects are not so numerous or so powerful as those whom it endangers, a party is made to overthrow the law; and this is often the case.

APHORISM 3.

Private right depends upon the protection of public right. For the law protects the people, and magistrates protect the laws; but the authority of the magistrates depends on the sovereign power of the government, the structure of the constitution, and the fundamental laws. Wherefore, if this part of the constitution be sound and healthy, the laws will be of good effect, but if not, there will be little security in them.

APHORISM 4.

It is not however the only object of public law, to be attached as the guardian of private right, to protect it from violation and prevent injuries; but it extends

also to religion, arms, discipline, ornaments, wealth, and in a word to everything that regards the well-being of a state.

APHORISM 5.

The end and scope which laws should have in view, and to which they should direct their decrees and sanctions, is no other than the happiness of the citizens. And this will be effected, if the people be rightly trained in piety and religion, sound in morality, protected by arms against foreign enemies, guarded by the shield of the laws against civil discords and private injuries, obedient to the government and the magistrates, and rich and flourishing in forces and wealth. And for all these objects laws are the sinews and instruments.

APHORISM 6.

This end the best laws attain, but many pass wide it. For there is a strange and extreme difference in laws; some being excellent, some moderately good, and others entirely vicious. I will therefore set down, according to the best of my judgment, what may be called certain "laws of laws," whereby we may derive information as to the good or ill set down and determined in every law.

APHORISM 7.

But before I proceed to the actual body of particular laws, I will take a brief survey of the virtues and dignities of laws in general. That law may be set down as good, which is certain in meaning, just in precept, convenient in execution, agreeable to the form of government, and productive of virtue in those that live under it.

TITLE I.

Of the Primary Dignity of Laws, that they be certain.

APHORISM 8.

Certainty is so essential to law, that law cannot even be just without it. "For if the trumpet give an uncertain sound, who shall prepare himself to the battle?"[1] So if the law give an uncertain sound, who shall prepare to obey it? It ought therefore to warn before it strikes. It is well said also, "That that is the best law which leaves least to the discretion of the judge;"[2] and this comes from the certainty of it.

APHORISM 9.

Uncertainty of laws is of two kinds; the one, where no law is prescribed; the other, where the law is ambiguous and obscure. We must therefore speak first of cases omitted by the law, that in these also we may find some rule of certainty.

Of Cases omitted by the Law.

APHORISM 10.

The narrow compass of human wisdom cannot take in all the cases which time may discover; whence new and omitted cases often present themselves. For these, the remedy or supplement is threefold; namely, by reference to similar cases, by employment of examples which have not yet grown into law, and by jurisdictions empowered to decide according to the arbitration of a good man and sound discretion, whether they be Prætorian or Censorian Courts.

[1] 1 Corinth. xiv. 8. [2] Arist. Rhet. i. 1.

Of Reference to Similar Cases, and the Extensions of Laws.

APHORISM 11.

In omitted cases, the rule of law is to be drawn from cases similar to them, but with caution and judgment; wherein the following rules are to be observed: Let reason be esteemed prolific, and custom barren. Custom must not make cases. Whatever therefore is received contrary to the reason of a law, or even where its reason is obscure, must not be drawn into consequence.

APHORISM 12.

Great public good draws omitted cases to itself. Wherefore when any law notoriously and to an extraordinary degree respects and procures the good of the people, let its interpretation be wide and comprehensive.

APHORISM 13.

It is harsh to torture laws, in order that laws may torture men. We would not therefore that penal, much less capital laws be extended to new offences. If however the offence be old and taken cognizance of by the laws, but the prosecution thereof fall upon a new case, unprovided for by the laws, we ought by all means to depart from the decrees of law rather than leave offences unpunished.

APHORISM 14.

In statutes which directly repeal the common law (especially in matters of frequent occurrence and long standing), we approve not the proceeding by similarity

to cases omitted. For when the state has long been without the entire law, and that too in expressed cases, there is little danger in allowing the cases omitted to wait for a remedy from a new statute.

APHORISM 15.

Statutes, which have a manifest relation to the time when they were made and spring out of a temporary emergency of state, when the state of the times is altered, should have all their due, if they retain their authority in the cases proper to them; for it would be preposterous to wrest them to omitted cases.

APHORISM 16.

Consequence does not draw consequence, but the extension should stop within the next cases; otherwise there will be a gradual lapse into dissimilar cases, and sharpness of wit will have greater power than authority of law.

APHORISM 17.

When laws and statutes are concise in style, extend freely; when they enumerate particular cases, more cautiously. For as exception corroborates the application of law in cases not excepted, so enumeration invalidates it in cases not enumerated.

APHORISM 18.

An explanatory statute stops the streams of the statute which it explains, and neither of them admit of extension afterwards. For the judge must not make a super-extension, when the law has once begun an extension.

APHORISM 19.

Formality of words and acts admits not of an extension to similar cases. For formality loses its character when it passes from custom to discretion; and the introduction of new things destroys the majesty of the old.

APHORISM 20.

The extension of the law to posthumous cases, which had no existence at the time of the passing of the law is easy. For where a case could not be expressed, as having no existence, a case omitted is taken for a case expressed, if there be the same reason for it.

Enough then on the extensions of laws in cases omitted. I will now speak of the employment of examples.

On Examples, and their Use.

APHORISM 21.

I now come to speak of examples, from which justice is to be derived when the law is deficient. Of custom, which is a kind of law, and of examples which by frequent use have passed into custom as a tacit law, I will speak in their place. But here I will speak of such examples as happen seldom and at distant intervals, and have not yet acquired the force of law; to show when, and with what caution, the rule of justice may be sought from them where the law is deficient.

APHORISM 22.

Examples are to be sought from good and moderate times, not from such as are tyrannical, factious, or dis-

solute. For those belonging to such times are spurious in their origin, and rather injurious than instructive.

APHORISM 23.

Of examples the latest are to be accounted the safest. For why should not that which has been lately done without any subsequent inconvenience be done again? But yet they have less authority; and if it happen that a reform be needed, modern examples savour more of their own age than of right reason.

APHORISM 24.

Ancient examples are to be received cautiously, and with proper selection. For the lapse of time makes many alterations, so that what in respect of time appears ancient is, by reason of the confusion which it makes and its inconformity to the present state of things, really new. Wherefore the best examples are those of the middle time, or else such a time as is most in conformity with the present age; and this is sometimes to be found in a more remote age rather than in that immediately preceding.

APHORISM 25.

Keep within, or rather on this side of the limits of the example, and on no account go beyond them. For where there is no rule of law, everything should be looked on with suspicion; and therefore, as in obscure cases, be very careful how you proceed.

APHORISM 26.

Beware of fragments, and epitomes of examples; and look carefully into the whole of the examples with

all the process thereof. For if it be unreasonable to judge of part of a law, without examining the whole; much more ought this to have weight in examples, the use whereof is doubtful, if they do not exactly correspond.

APHORISM 27.

It is of great importance through what hands examples have passed, and by whom they have been sanctioned. For if they have only passed among clerks and secretaries, in the ordinary course of the court, without the manifest knowledge of the higher officers; or among the teacher of all errors, the people; they are to be condemned and held of little account. But if they have passed under the eyes of senators, judges, or the principal courts, in such a manner that they must needs have been strengthened by at least the tacit approval of the judges, they are entitled to more authority.

APHORISM 28.

Examples, which even though they have been little used have been published, yet having been well debated and ventilated in discourse and discussion, deserve more authority; but those, which have lain as it were buried in desks and archives and have openly passed into oblivion, deserve less. For examples like waters are most wholesome in a running stream.

APHORISM 29.

Examples which have reference to laws should not be sought from historians, but from public acts and the more careful traditions. For it is a misfortune even of the best historians, that they do not dwell sufficiently upon laws and judicial acts; or if by chance they use

some diligence therein, yet they differ greatly from the authentic reporters.

APHORISM 30.

An example, which the same or the succeeding age has upon the recurrence of the case rejected, should not be readily re-admitted. For the fact that it was once adopted does not tell so much in its favour, as the subsequent abandonment tells against it.

APHORISM 31.

Examples are to be used for advice, not for rules and orders. Wherefore let them be so employed as to turn the authority of the past to the use of the present.

Enough then of instruction from examples where the law is deficient. I must now speak of the Courts Prætorian and Censorian.

On Courts Prætorian and Censorian.

APHORISM 32.

Let there be courts and jurisdictions to determine, by the judgment and discretion of a conscientious man, when the rule of the law is deficient. For the law (as has been before said) cannot provide for all cases, but is adapted to meet such as generally occur. And time, according to the ancient saying, is the wisest of all things,[1] and daily creates and invents new cases.

APHORISM 33.

Fresh cases happen both in criminal causes which

[1] Xen. Hell. iii. 3. 2.

require punishment, and in civil causes which require relief. The courts which take cognizance of the former I call Censorian, those which respect the latter, Prætorian.

APHORISM 34.

Let the Censorian Courts have power and jurisdiction, not only to punish new offences, but also to increase the punishments appointed by law for old ones, where the cases are heinous and enormous, provided they are not capital. For an enormous crime has somewhat of the nature of a new one.

APHORISM 35.

In like manner let the Prætorian Courts have power both to abate the rigor of the law and to supply its defects. For if relief is due to a person whom the law has neglected, much more is it due to one whom it has wounded.

APHORISM 36.

Let these Prætorian and Censorian Courts entirely confine themselves to monstrous and extraordinary cases, and not encroach upon the ordinary jurisdictions, lest they rather tend to supplant than to supply the law.

APHORISM 37.

Let these jurisdictions reside only in the supreme courts, and not be shared by the lower; for the power of supplying, extending, and moderating laws, differs little from that of making them.

APHORISM 38.

Let not these courts be entrusted to the charge of one man, but let them consist of many. And let not

the decrees go forth in silence, but let the judges give the reasons of their decision, and that openly and in full court; so that what is free in point of power may yet be restrained by regard to character and reputation.

APHORISM 39.

Let there be no authority to shed blood; nor let sentence be pronounced in any court upon capital cases, except according to a known and certain law. God himself denounced death before he inflicted it. Nor should a man be deprived of his life, who did not first know that he was risking it.

APHORISM 40.

In the Censorian Courts, let there be opportunity for three verdicts; that the judges may not be obliged to acquit or condemn, but be at liberty to declare the fact "not proven." And besides the penalty, let there be power also to inflict a note or mark; such I mean as shall not extend to actual punishment, but may end either in admonition only, or in a light disgrace; punishing the offender as it were with a blush.

APHORISM 41.

In Censorian Courts, let the commencements and middle acts of all great crimes and offences be punished, even though the end be not consummated. And let this be even the principal use of these courts; for it is as well the part of severity to punish the commencements of crimes, as of mercy to prevent their completion, by punishing the intermediate acts.

APHORISM 42.

Especial care must be taken in Prætorian Courts, not to afford relief in such cases as the law has not so much omitted, as despised for their unimportance, or for their odious nature judged unworthy of redress.

APHORISM 43.

It is of the greatest importance to the certainty of laws (of which I am now treating), that Prætorian Courts be not allowed to swell and overflow, so as, under colour of mitigating the rigour of the law, to break its strength and relax its sinews, by drawing everything to be a matter of discretion.

APHORISM 44.

Let not the Prætorian Courts have authority, under any pretext of equity, to decree against an express statute. For in that case the judge would pass into the legislator, and everything would be at discretion.

APHORISM 45.

Some hold that the jurisdiction which decrees according to equity and conscience, and that which proceeds according to strict justice, ought to be deputed to the same courts; but others would have them kept separate. I am clearly for keeping them separate. For if there be a mixture of jurisdictions, the distinction of cases will not be retained, but discretion will in the end supersede the law.

APHORISM 46.

The Prætor's Table at Rome, wherein he set down

and published the rules by which he meant to judge, was not established without good reason. And after this example, judges in the Prætorian Courts ought, as far as possible, to propose certain rules for themselves, and set them up where they can be seen by the people. For as that is the best law which leaves the least to the discretion of the judge, so he is the best judge who leaves the least to himself.

But I will treat more fully of these courts when I come to speak of judgments; for here I have only noticed of them in passing, in what way they remedy and supply the omissions of law.

Of the Retrospective Aspect of Laws.

APHORISM 47.

There is likewise another kind of supplement to omitted cases; namely, when one law follows and amends another, and draws the omitted cases along with it. And this is done by those laws and statutes which are called retrospective. But laws of this kind must be used seldom, and with great caution; for we approve not of a Janus in laws.

APHORISM 48.

He who evades and narrows the words or meaning of a law by fraud and cavil deserves to be himself ensnared by a subsequent law. And therefore in cases of fraud and captious evasion it is just that laws should be retrospective, and be of assistance one to the other; that a man who plots to deceive and upset the present laws may at least feel apprehensions from future ones.

APHORISM 49.

Laws which strengthen and confirm the real intentions of acts and instruments against the defects of forms and usages very properly include past actions. For the principal inconvenience of a retrospective law is that it creates disturbance; but confirmatory laws of this sort tend rather to peace and the settlement of past transactions. We must however take care not to call in question matters already adjudged.

APHORISM 50.

It must be observed that not those only are to be considered retrospective laws which invalidate acts passed; but those likewise which prohibit and restrain future acts as necessarily connected with the past. Thus a law which should prohibit certain artisans from henceforth selling their wares seems only to bear upon the future, yet it operates on the past; for such persons have not now the power to seek their living in another way.

APHORISM 51.

Every declaratory law, though it does not mention the past, yet by the very force of the declaration must needs apply to past transactions. For the interpretation does not date from the time of the declaration, but is made as it were contemporary with the law itself. And therefore enact no declaratory laws, except in cases where they may be justly retrospective.

And here I end that part which treats of Uncertainty of laws, where no law exists. I must now speak of that other part, where some law is extant, but confused and obscure.

Of Obscurity of Laws.

APHORISM 52.

Obscurity of laws arises from four sources; either from an excessive accumulation of laws, especially if they be mixed with such as are obsolete; or from an ambiguity, or want of clearness and distinctness in the drawing of them; or from negligent and ill-ordered methods of interpreting law; or lastly, from a contradiction and inconsistency of judgments.

Of Excessive Accumulation of Laws.

APHORISM 53.

The prophet says, "He shall rain snares upon them."[1] But there are no worse snares than legal snares, especially in penal laws; if being infinite in number, and useless through the lapse of time, instead of being as a lantern to the feet they are as nets in the path.

APHORISM 54.

There are two ways in use of making a new statute. The one confirms and strengthens former statutes on the same subject, and then makes a few additions and alterations. The other repeals and cancels all former enactments, and substitutes an entirely new and uniform law. The last method is the best. For by the former the enactments become confused and complicated, and though indeed the immediate object is effected, yet the body of laws is in the meantime corrupted. But in the latter, though greater care is required in deliberating about the law itself, and former

[1] Psalm xi. 6.

acts must be carefully searched and canvassed before it pass; yet it is the best course for securing harmony in times to come.

APHORISM 55.

The Athenians had a custom of appointing six men to examine every year the contradictory titles of their laws (which they called *Antinomies*) and to report to the people such as could not be reconciled, that a definite resolution might be passed concerning them. After their example let the legislators of every state every three or five years, or as often as it appears good, review their Antinomies. And let these be first examined and drawn up by commissioners appointed for the purpose, and then laid before the Parliament, that the matter may be settled and established by vote.

APHORISM 56.

But let there not be too great an eagerness and anxiety to reconcile or salve (as they term it) these contradictory titles by fine and far-fetched distinctions. For this is a web of the wit; which, whatever appearance of modesty and reverence it may bear, must yet be regarded as prejudicial, seeing that it makes the whole body of laws ill-assorted and incoherent. It is therefore far better to let the worse titles drop, and leave the best to stand alone.

APHORISM 57.

It should also be a part of the office of the Commissioners to propose that obsolete laws and such as have fallen into disuse should be repealed, as well as antinomies. For since an express statute is not regularly

abolished by disuse, it comes to pass that through the contempt of obsolete laws the authority of the rest is somewhat impaired. And from this ensues a torment like that of Mezentius, whereby the living laws are stifled in the embraces of the dead. And above all things a gangrene in our laws is to be avoided.

APHORISM 58.

But in the meantime let the Prætorian Courts have power to decree against laws and statutes which are obsolete, and have not lately passed. For though it has been well said, "that no one should be wiser than the laws,"[1] yet this must be understood of waking and not of sleeping laws. Not so however with more recent statutes, which are found to be injurious to public justice. The power of giving relief in this case should be left not to the judge, but to kings, councils, and the supreme authorities of the state, who should be empowered to suspend the execution of them by Acts or Proclamations, till the re-assembling of Parliament or of that body which has the power of repealing them; lest in the meantime the welfare of the community be endangered.

Of New Digests of Laws.

APHORISM 59.

But if the laws by accumulation have grown so voluminous, or become so confused that it is expedient to remodel them entirely, and reduce them to a sound and manageable body, let it by all means be done; and let it be considered a heroic work; and let the authors

[1] Cf. Arist. Rhet. i. 15. 12.; and Thucyd. iii. 37.

thereof be justly and deservedly reckoned among legislators and reformers of law.

APHORISM 60.

This kind of expurgation and new digest of laws is effected by five processes. First, let obsolete laws, which Justinian calls old fables,[1] be omitted. Secondly, let the most approved antinomies be received, and the rest abolished. Thirdly, let *Homoionomies*, or laws which are of the same import and nothing else but reiterations of the same thing, be erased, and let the one which is the most perfect among them be retained in place of all the rest. Fourthly, let such laws as determine nothing, but only propose questions, and leave them undecided, be dismissed in like manner. Lastly, let those laws which are found to be wordy and too prolix be more compressed and abridged.

APHORISM 61.

It will be very useful in a new digest of laws to digest and arrange separately on the one side all the laws received as Common Law, the existence whereof is as it were from time immemorial; and on the other side the statutes, which have from time to time been superadded. For in many points, in passing judgment, the interpretation and administration of the Common Law are not the same as the Statute Law. And this was the plan followed by Trebonianus in the Digest and Code.

APHORISM 62.

But in this regeneration and reconstruction of the laws, by all means retain the words and text of the old

[1] Institut. Proœm. § 3.

laws and law-books, though it be necessary to extract them by scraps and fragments: and afterwards connect them together in proper order. For although this might perhaps be done more conveniently, and, if you look to right reason, more correctly also by a new text than by patching up the old; yet in laws we ought not so much to look to style and drawing up as to authority, and its patron, antiquity. Otherwise the work would appear rather a matter of scholarship and method, than a body of commanding laws.

APHORISM 63.

It will be expedient in this new digest of laws that the old volumes do not altogether perish and pass into oblivion; but that they be preserved at least in libraries, though the ordinary and promiscuous use of them be prohibited. For in important cases it will not be amiss to examine and consider the successive changes which have taken place in past laws. And surely it is a reverent thing to intermingle antiquity with things present. But this new body of laws ought to be regularly confirmed by the legislative power of the state; lest, under pretence of digesting old laws, new laws be secretly imposed.

APHORISM 64.

It were desirable that this instauration of the laws should be undertaken in such times as are superior in learning and experience to those more ancient times whose works and acts they revise. But the reverse of this happened in the work of Justinian. For it is an unfortunate circumstance, when by the taste and judgment of a less wise and less learned generation

the works of the ancients are mutilated and reconstructed. But that is often necessary which is not best.

So much then for obscurity of laws arising from an excessive and confused accumulation thereof. I now come to speak of the ambiguous and obscure drawing up of them.

Of the Confused and Obscure Drawing up of Laws.

APHORISM 65.

Obscure drawing up of laws arises either from their loquacity and verbosity, or on the other hand from an excess of conciseness, or from the preamble of the law being at variance with the body.

APHORISM 66.

I must now speak of the obscurity of laws which arises from their being ill drawn up. The loquacity and prolixity used in the drawing up of laws I do not approve. For it does not at all secure its intention and purpose; but rather the reverse. For while it tries to enumerate and express every particular case in apposite and appropriate words, expecting greater certainty thereby; it does in fact raise a number of questions about words; so that, by reason of the noise and strife of words, the interpretation which proceeds according to the meaning of the law (which is the juster and sounder kind of interpretation) is rendered more difficult.

APHORISM 67.

Not that I therefore approve of a too concise and

affected brevity, as being the style of majesty and command, especially in these times; lest by chance the law should become like a Lesbian rule.[1] We must therefore aim at a mean, and look out for a well-defined generality of words; which though it does not attempt to express all the cases comprehended, yet excludes with sufficient clearness the cases not comprehended.

APHORISM 68.

In ordinary laws and proclamations of state however, in which lawyers are not generally consulted, but every man trusts to his own judgment, everything should be more fully explained, and pointed out, as it were with the finger, to the capacity of the people.

APHORISM 69.

Nor should I at all approve of the preambles of laws, which were formerly deemed impertinent, and which represent laws disputing and not commanding, if we could endure the ancient manners. But as times now are, these preambles are necessarily used in most cases, not so much to explain the law, as to persuade Parliament to pass it, and also to satisfy the people. But avoid preambles as much as possible, and let the law commence with the enactment.

APHORISM 70.

Though the intention and purport of a law may sometimes be well gathered from the prefaces and preambles, yet the latitude or extension thereof should by no means be sought from thence. For the preamble often selects a few of the most plausible and specious points

[1] Cf. Erasm. Adag. i. 93., and cf. Arist. Ethics, v. 10.

by way of example, even when the law contains many things besides. Or on the other hand the law sometimes makes many restrictions and limitations, the reasons whereof need not be inserted in the preamble. Wherefore the extent and latitude of a law is to be taken from the body thereof; for the preamble often either exceeds or falls short of it.

APHORISM 71.

There is one very faulty method of drawing up laws. And this is, when the case at which the law aims is fully set forth in the preamble; and then from the force of the word "such" or some like relative, the body of the law is reflected back upon the preamble, which is thereby inserted and incorporated into the law, and renders it both more obscure and less safe. For the same care is not usually employed in weighing and examining the words of the preamble which is bestowed on the body of the law itself.

But this part of the uncertainty of laws, arising from their being ill drawn up, I will treat of more fully, when I come afterwards to the interpretation of laws. And so much for the obscure drawing up of laws; I must now speak of the methods of expounding law.

Of the Methods of Expounding Law, and Removing Ambiguities.

APHORISM 72.

There are five methods of expounding law, and removing ambiguities: namely, by reports of judgments; by authentic writers; by auxiliary books; by prelec-

tions; or by the answers and decrees of learned men. All these if properly instituted will be of great service against the obscurity of laws.

Of the Reporting of Judgments.

APHORISM 73.

Above all things, let the Judgments delivered in the Supreme and Principal Courts on important cases, especially if they be doubtful and contain some difficulty or novelty, be diligently and accurately taken down. For judgments are the anchors of laws, as laws are of the state.

APHORISM 74.

Let this be the method of taking down judgments and committing them to writing. Record the cases precisely, the judgments themselves word for word; add the reasons which the judges allege for their judgments; do not mix up the authority of cases brought forward as examples with the principal case; and omit the perorations of counsel, unless they contain something very remarkable.

APHORISM 75.

Let the reporters be taken from the most learned counsel, and receive a liberal salary from the state. But let not the judges themselves meddle with the reports; lest from being too fond of their own opinions, and relying on their own authority, they exceed the province of a reporter.

APHORISM 76.

Let these judgments be digested in chronological order, and not by method and titles. For such writings are a kind of history or narrative of the laws. And not only the acts themselves, but the times also when they passed, give light to a wise judge.

Of Authentic Writers.

APHORISM 77.

Let the body of law be composed only of the laws that constitute the Common Law, of the constitutional laws or statutes, and of reported judgments. Besides these, let no others be deemed authentic, or at least let them be sparingly accepted.

APHORISM 78.

Nothing contributes so much to the certainty of laws (whereof I am now treating), as to keep the authentic writings within moderate bounds, and to get rid of the enormous multitude of authors and doctors of laws. For by them the meaning of laws is distracted, the judge is perplexed, the proceedings are made endless, and the advocate himself, as he cannot peruse and master so many books, takes refuge in abridgments. Perhaps some one good commentary, and a few classic authors, or rather some few selections from some few of them, may be received as authentic. Let the rest however be kept for use in libraries, that the judges or counsel may inspect them if necessary; but let them not be allowed to be pleaded in court, or to pass into authorities.

Of Auxiliary Books.

APHORISM 79.

The science and practice of the law should not be deprived of auxiliary books, but rather well furnished with them. These are of six kinds; namely, Institutes: On Terms of Law: On Rules of Law: Antiquities of Laws: Summaries: and Forms of Pleading.

APHORISM 80.

Students and novices are to be educated and trained by Institutes to take in more readily and profoundly the higher parts of the law. Let these Institutes be arranged in a clear and perspicuous order. Let them run through the whole private law, not omitting some things, and dwelling too long on others; but giving a slight sketch of all; so that when the student comes to peruse the body of law he may find nothing entirely new, or of which he has not had a slight notion beforehand. But touch not the public law in these institutes, but let that be drawn from the fountains themselves.

APHORISM 81.

Construct a commentary on legal terms; but let it not enter too curiously or laboriously into an explanation of their full sense. For the object is not so much to look for exact definitions of the words, as for explanations to make the way easier in reading law books. And let not this treatise be digested in the order of the alphabet, but leave that to an index; and let the words which relate to the same thing be arranged together, that the one may serve to explain the other.

APHORISM 82.

A good and careful treatise on the different rules of law conduces as much as anything to the certainty thereof; and it deserves to be entrusted to the ablest and wisest lawyers. For I am not content with the works of this kind which are now extant. The collection should consist not only of the common and well known rules, but of others likewise more subtle and abstruse, which may be gathered from the harmony of laws and decided cases; such as are sometimes found in the best tables of contents; and are in fact the general dictates of reason, which run through the different matters of law, and act as its ballast.

APHORISM 83.

But let not every decree or position of law be taken for a rule; as is commonly done, ignorantly enough. For if this were admitted there would be as many rules as laws; for law is nothing else than a commanding rule. But let those be considered rules which are inherent in the very form of justice; and whereby it comes that for the most part nearly the same rules are found in the civil laws of different states; except perhaps that they may sometimes vary with reference to the forms of constitutions.

APHORISM 84.

After a rule has been stated in a concise and solid form of words, let examples, and such decisions of cases as are most clear, be added for the explanation; distinctions and exceptions for the limitation; and kindred cases for the amplification of the rule.

APHORISM 85.

It is a sound precept not to take the law from the rules, but to make the rule from the existing law. For the proof is not to be sought from the words of the rule, as if it were the text of law. The rule, like the magnetic needle, points at the law, but does not settle it.

APHORISM 86.

Besides the body of law, it will be of service likewise to take a survey of the antiquities thereof; of which though the authority has perished, yet the reverence still remains. And by antiquities of laws, I understand those writings on laws and judgments, whether published or unpublished, which preceded the body of law; for these should not be lost. Wherefore select the most useful of them, (for many will be found to be frivolous and unprofitable) and collect them into one volume; that old fables, as Trebonianus calls them, may not be mixed up with the actual laws.

APHORISM 87.

It is of great importance to practice, that the whole law should be arranged in order under titles and heads; to which reference may be made at once, when occasion shall require as to a store house provided for present wants. Summaries of this kind both reduce to order what is dispersed in the law, and abridge what is diffuse and prolix. But we must take care that while they make men ready in practice, they do not make them idlers in the science itself; for their business is to facilitate the recollection of the law, not to teach it. But these summaries are by all means to be con-

structed with great care, accuracy, and judgment, lest they cheat the laws.

APHORISM 88.

Collect the different forms of pleading of every sort. For this is both a help to practice; and besides, these forms disclose the oracles and mysteries of laws. For many things lie concealed in the laws, which in these forms of pleading are more fully and clearly revealed; the one being as the fist, the other as the open hand.

Of Answers and Opinions.

APHORISM 89.

Some means should be devised for solving and clearing away the particular doubts which from time to time arise. For it is hard that they who desire to secure themselves from error should not be able to find a guide; but that their actions must themselves run the risk, there being no means of knowing the law before the thing is done.

APHORISM 90.

I do not approve that the answers of learned men, whether advocates or doctors of law, given to those who ask their advice on a point of law, should have such authority that the judge should not be allowed to depart from their opinions. Let the laws be taken from sworn judges.

APHORISM 91.

I do not approve that men should make trial of judgments under feigned persons and causes, for the pur-

pose of ascertaining what the rule of law will be. For this lowers the majesty of the laws and is a kind of prevarication. Besides, it is unseemly for judicial proceedings to borrow anything from the stage.

APHORISM 92.

Therefore, let judgments, as well as answers and opinions, proceed from the judges alone; the former in questions on pending suits, the latter on difficult points of law. And let not these opinions, whether on public or private matters, be demanded from the judges themselves, (for that were to turn the judge into an advocate); but from the king or state. Let the king or state refer them to the judges. Let the judges thus authorised hear the pleadings of the advocates, whether selected by the parties themselves, or (if necessary) appointed by the judges themselves, and the arguments on both sides; and after deliberating on the case let them deliver and declare the law. Let these opinions be recorded and published among judgments, and be of equal authority with them.

Of Prelections.

APHORISM 93.

Let the lectures and exercises of those who study and labour at the law be so ordered and instituted, as rather to set legal questions and controversies at rest, than to raise and excite them. For at present there are nothing but schools and institutions for multiplying altercations and controversies on points of law, as if for the display of wit. And this evil is also an old one. For it was likewise the pride of antiquity, as by sects

and factions, to keep alive a number of questions of law, rather than to settle them. Let this however be provided against.

Of Inconsistency of Judgments.

APHORISM 94.

Inconsistency of judgments arises either from an immature and hasty decision, or from the rivalry of Courts, or from a bad and ignorant reporting of judgments, or from too great facility being given for their reversal. Care therefore should be taken that judgments proceed after mature deliberation; that courts preserve mutual respect for one another; that judgments be faithfully and wisely reported; and that the way to a repeal of judgments be narrow, rocky, and as it were paved with flint stones.

APHORISM 95.

If judgment be given on any case in a principal court, and a similar case occur in any other, do not proceed to pass judgment till a consultation has been held in some general assembly of the judges. For if it be that previous decisions must be rescinded, at least let them be interred with honour.

APHORISM 96.

That Courts should fence and dispute about jurisdiction is natural to humanity; the rather because of a foolish doctrine, that it is the part of a good and active judge to extend the jurisdiction of his Court; which stimulates the disease and applies a spur where a bit is needed. But that through this spirit of con-

tention courts should freely rescind each other's judgments (judgments having nothing to do with the question of jurisdiction) is an intolerable evil, that should by all means be put down by kings or senates or governments. For it is a most pernicious example, that courts, whose business it is to keep the subjects at peace, should be at war with one another.

APHORISM 97.

Let not the way to a repeal of judgments by appeals, writs of error, new trials, and the like, be much too easy and open. Some hold that a suit should be withdrawn to a higher court, as quite a new cause, the previous judgment being completely laid aside and suspended. Others are of opinion that the judgment itself should remain in full force, whilst only its execution should be deferred. I do not like either of these ways; unless the courts wherein judgment has been delivered be of a low and inferior character; but I would rather let both the judgment stand, and the execution proceed, the defendant only giving security for costs and damages if the judgment be reversed.

This Title then touching Certainty of Laws shall stand as a model of the rest of the Digest which I have in mind.

But here I have concluded Civil Knowledge (as far as I have thought right to handle it), and together with it Human Philosophy, and, with Human Philosophy, Philosophy in General. At length therefore having arrived at some pause, and looking back into those things which I have passed through, this treatise of mine seems to me not unlike those sounds and prel-

udes which musicians make while they are tuning their instruments, and which produce indeed a harsh and unpleasing sound to the ear, but tend to make the music sweeter afterwards. And thus have I intended to employ myself in tuning the harp of the muses and reducing it to perfect harmony, that hereafter the strings may be touched by a better hand or a better quill. And surely, when I set before me the condition of these times, in which learning seems to have now made her third visitation to men; and when at the same time I attentively behold with what helps and assistances she is provided; as the vivacity and sublimity of the many wits of this age; the noble monuments of ancient writers, which shine like so many lights before us; the art of printing, which brings books within reach of men of all fortunes; the opened bosom of the ocean, and the world travelled over in every part, whereby multitudes of experiments unknown to the ancients have been disclosed, and an immense mass added to Natural History; the leisure time which the greatest wits in the kingdoms and states of Europe everywhere have at their disposal, not being so much employed in civil business as were the Greeks in respect of their popular governments, and the Romans in respect of the greatness of their monarchy; the peace which Britain, Spain, Italy, France too at last, and many other countries now enjoy; the consumption and exhaustion of all that can be thought or said on religious questions, which have so long diverted many men's minds from the study of other arts; the excellence and perfection of your Majesty's learning, which calls whole flocks of wits around you, as birds round a phœnix; and lastly the inseparable property of time, ever more and more

to disclose Truth; I cannot, I say, when I reflect on these things but be raised to this hope, that this third period will far surpass the Greek and Roman in learning; if only men will wisely and honestly know their own strength and their own weakness; and take from one another the light of invention and not the fire of contradiction; and esteem the inquisition of truth as a noble enterprise, and not a pleasure or an ornament; and employ wealth and magnificence on things of worth and excellence, not on things vulgar and of popular estimation. As for my labours, if any man shall please himself or others in the reprehension of them, they shall make at all events that ancient and patient request, "Strike, but hear."[1] Let men reprehend them as much as they please, if only they observe and weigh what is said. For the appeal is lawful, though perhaps it may not be necessary, from the first cogitations of men to their second, and from the present age to posterity. Now let us come to that learning which the two former periods have not been so blessed as to know, namely, *Sacred and Inspired Divinity*, the most noble Sabbath and port of all men's labours and peregrinations.

[1] Plut. in Themist. c. 11.

OF

THE ADVANCEMENT OF LEARNING.

BOOK IX.

CHAPTER I.

The Divisions of Inspired Divinity are omitted — Introduction only is made to three Deficients; namely, the Doctrine concerning the Legitimate Use of the Human Reason in Divine Subjects; the Doctrine concerning the Degress of Unity in the Kingdom of God; and the Emanations of the Scriptures.

SEEING now, most excellent king, that my little bark, such as it is, has sailed round the whole circumference of the old and new world of sciences (with what success and fortune it is for posterity to decide), what remains but that having at length finished my course I should pay my vows? But there still remains Sacred or Inspired Divinity; whereof however if I proceed to treat I shall step out of the bark of human reason, and enter into the ship of the church; which is only able by the Divine compass to rightly direct its course. Neither will the stars of philosophy, which have hitherto so nobly shone upon us, any longer supply their light. So that on this subject also it will be as well to keep silence. I will accordingly omit the proper divi-

sions thereof, contributing however a few remarks upon it, according to my slender ability, by way of paying my vows. And I am the more inclined to do this, because in the body of Theology I find no region or district entirely desert and uncultivated; such has been the diligence of man in sowing wheat or tares.

I will propose therefore three Appendices of Theology, which treat, not of the matter concerning which theology gives or shall give information, but only of the manner in which the information is imparted. I will not however, as in other like cases, either introduce examples or give precepts. That I will leave to theologians; for these, as I have said, are only in the place of vows.

The prerogative of God comprehends the whole man, extending to the reason as well as to the will; that man may deny himself entirely, and draw near unto God. Wherefore as we are bound to obey the divine law though we find a reluctation in our will, so are we to believe His word though we find a reluctation in our reason. For if we believe only that which is agreeable to our sense, we give consent to the matter and not to the author, which is no more than we would do to a suspected witness. But that faith which was accounted to Abraham for righteousness was of such a nature that Sarah laughed at it, who therein was an image of natural reason. The more discordant therefore and incredible the Divine mystery is, the more honour is shown to God in believing it, and the nobler is the victory of faith. Nay, even sinners, the more they are oppressed in their conscience, trusting nevertheless to be saved through the mercy of God, the more do they

honour Him; for all despair is a kind of reproach towards God. Howbeit, if we will truly consider it, it is more worthy to believe, than to know as we now know. For in knowledge man's mind suffers from sense which is the reflection of things material, but in faith the spirit suffers from spirit which is a worthier agent. Otherwise it is in the state of man glorified, for then faith shall cease, and we shall know even as we are known.

Wherefore we conclude that Sacred Theology ought to be derived from the word and oracles of God, and not from the light of nature, or the dictates of reason. For it is written, "The heavens declare the glory of God,"[1] but it is nowhere written, "The heavens declare the will of God;" but of that it is said, "To the law and to the testimony; if men do not according to this word, &c."[2] And this holds not only in those great mysteries which concern the Deity, the Creation, and the Redemption; but it pertains likewise to a more perfect interpretation of the moral law, "Love your enemies;" "do good to them that hate you," and so on; "that ye may be the children of your father who is in heaven, that sendeth rain upon the just and the unjust."[3] To which words this applause may well be applied, "that they do not sound human;"[4] since it is a voice beyond the light of nature. Again, we see the heathen poets, especially when they discourse of the passions, often expostulate with laws and moral doctrines (which yet are far more easy and indulgent than the divine laws), as if they were contradictory

[1] Psalm xix. 1. [2] Isaiah, viii. 20.
[3] St. Matt. v. 44, 45.
[4] Virg. Æn. i. 328.: Nec vox hominum sonat.

and malignant to the liberty of nature; "What nature grants the envious laws deny."[1] So said Dendamis the Indian to Alexander's messengers, "That he had heard somewhat of the name of Pythagoras and some other wise men of Greece, and that he held them for excellent men; but that they had a fault, which was that they had too great reverence and veneration for a kind of phantom, which they called law and manners."[2] Wherefore it must be confessed that a great part of the moral law is higher than the light of nature can aspire to. Nevertheless what is said, that man has by the light and law of nature some notions of virtue and vice, justice and injustice, good and evil, is most true. For we must observe that the light of nature is used in two several senses; the one, as far as it springs from sense, induction, reason, argument, according to the laws of heaven and earth; the other, as far as it flashes upon the spirit of man by an inward instinct, according to the law of conscience; which is a spark and relic of his primitive and original purity. And in this latter sense chiefly does the soul partake of some light to behold and discern the perfection of the moral law; a light however not altogether clear, but such as suffices rather to reprove the vice in some measure, than to give full information of the duty. So then religion, whether considered with regard to morals or mysteries, depends on revelation from God.

The use notwithstanding of reason in spiritual things is manifold and very general. For it is not for nothing that the Apostle called religion, "Our reasonable ser-

[1] Ovid. Metam. x. 330.:

Et quod natura remittit,
Invida jura negant.

[2] Cf. Plut. in Alex. c. 65.; and Strabo, l. xv.

vice of God."[1] If we review the types and ceremonies of the old law we see that they were full of reason and signification, differing widely from the ceremonies of idolatry and magic, which were like surds and non-significants, mostly without meaning, and not even suggestive of anything. But especially the Christian faith, as in all things, so in this is pre-eminent; holding the golden mean touching the use of reason and discussion (the child of reason) between the law of the heathen and the law of Mahomet, which embrace the two extremes. For the religion of the heathen had no constant belief or confession; and the religion of Mahomet on the other side interdicts argument altogether; so that the one has the very face of vague and manifold error, the other of crafty and cautious imposture; whereas the holy Christian faith both admits and rejects the use of reason and disputation, but according to just limitations.

The use of human reason in matters of religion is of two sorts; the former in the explanation of the mystery, the latter in the inferences derived from it. With regard to the explanation of the mysteries, we see that God vouchsafes to descend to the weakness of our apprehension, by so expressing his mysteries that they may be most sensible to us; and by grafting his revelations upon the notions and conceptions of our reason; and by applying his inspirations to open our understanding, as the form of the key to the ward of the lock. But here we ought by no means to be wanting to ourselves; for as God uses the help of our reason to illuminate us, so should we likewise turn it every way, that we may be more capable of receiving and under-

[1] Romans, xii. 1.

standing His mysteries; provided only that the mind be enlarged, according to its capacity, to the grandeur of the mysteries, and not the mysteries contracted to the narrowness of the mind.

But with regard to inferences, we should know that there is allowed us a use of reason and argument (in regard to mysteries) secondary and respective, though not original and absolute. For after the articles and principles of religion have been set in their true place, so as to be completely exempted from the examination of reason, it is then permitted us to derive and deduce inferences from them according to their analogy. In nature indeed this holds not. For both the principles themselves are examinable, though not by a syllogism, yet by induction; and besides, these same principles have no discordance with reason, so that the first and middle propositions are derived from the same fountain. It is otherwise in religion, where the first propositions are not only self-existent and self-supporting; but likewise unamenable to that reason which deduces consequent propositions. Nor yet does this hold in religion alone, but also in other sciences both of a greater and smaller nature; namely, wherein the primary propositions are arbitrary and not positive; for in these also there can be no use of absolute reason. For we see in games, as chess or the like, that the first rules and laws are merely positive, and at will; and that they must be received as they are, and not disputed; but how to play a skilful and winning game is scientific and rational. So in human laws there are many maxims, as they call them, which are mere Placets of Law, dependent on authority rather than upon reason, and therefore not to be disputed. But what is most just, not

absolutely but relatively (that is, according to these maxims), that is a matter of reason, and opens a wide field for disputation. Such therefore is that secondary reason which has place in Divinity, which is grounded upon the Placets of God.

But as the use of the human reason in things divine is of two kinds, so likewise in the use there are two kinds of excess; the one when it inquires too curiously into the manner of the mystery; the other when the same authority is attached to inferences as to principles. For he may appear to be the disciple of Nicodemus who persists in asking, "How can a man be born when he is old?"[1] And he can be nowise considered the disciple of Paul who does not sometimes insert in his doctrines, "I, not the Lord;" or again, "According to my counsel;"[2] which style is generally suited to inferences. Wherefore it appears to me that it would be of especial use and benefit, if a temperate and careful treatise were instituted, which, as a kind of divine logic, should lay down proper precepts touching the use of human reason in theology. For it would act as an opiate, not only to lull to sleep the vanity of curious speculations, wherewith sometimes the schools labour, but also in some degree to assuage the fury of controversies, wherewith the church is troubled. Such a treatise I reckon among the things deficient; and call it *Sophron* or *The Legitimate Use of Human Reason in Divine Subjects.*

It is of extreme importance to the peace of the Church, that the Christian covenant ordained by our Saviour be properly and clearly explained in those two heads, which appear somewhat discordant; whereof the

[1] St. John, iii. 4. 10. [2] 1 Corinth. vii. 10.

one lays down, "He that is not with us is against us;"[1] and the other, "He that is not against us is with us."[2] From this it is evident that there are some articles, wherein if a man dissent he is placed beyond the pale of the covenant; but that there are others in which he may dissent, and yet remain within it. For the bonds of the Christian Communion are set down, "one Lord, one Faith, one Baptism, &c.,"[3] not one Ceremony, one Opinion. So we see the coat of our Saviour was without seam, but the garment of the church was of divers colours. The chaff should be separated from the corn in the ear, but the tares should not be pulled up from the corn in the field. Moses, when he saw the Egyptian fighting with the Israelite, did not say, "Why strive ye?" but drew his sword and slew the Egyptian.[4] But when he saw the two Israelites fighting, though it were not possible for both to be in the right, yet he addresses them thus, "Ye are brethren, why strive ye?" And therefore on these considerations it appears a thing of great use and importance, well to define what and of what latitude those points are, which disincorporate men from the Church of God, and excommunicate them from the communion of the faithful. And if any one think that this has already been done, let him think again and again, and say whether it has been done with sincerity and moderation. Meanwhile if a man talks of peace, he is very like to get the answer of Jehu to the message, ("Is it peace, Jehu?") "What hast thou to do with peace? turn thee behind me;"[5] for it is not peace but party that most men care for. Nevertheless I have thought right to set down

[1] St. Luke, xi. 23. or St. Matt. xii. 30.
[2] St. Luke, ix. 50.
[3] Ephes. iv. 5.
[4] Exod. ii. 12.
[5] 2 Kings, ix. 19.

among the deficients a treatise *on the degrees of Unity in the kingdom of God*, being as a wholesome and profitable undertaking.

Since the Holy Scriptures are the principal sources of information in theology, we must especially look to their interpretation. And I am not now speaking of the authority of interpreting them, which rests in the consent of the church; but of the manner thereof; which is of two sorts; methodical and free. For this divine water, which excels so much that of Jacob's well, is drawn forth and employed much in the same manner as natural water is out of wells and fountains. For it is either first forced up into cisterns, whence it may be conveniently fetched and derived by pipes for use; or else it is poured into buckets and vessels to be used as it is wanted. The former method has in the end produced to us the scholastical divinity; whereby divinity has been reduced into an art, as into a cistern, and the streams of doctrines and positions have been derived and conveyed from thence to water every part. But in the free way of interpreting Scripture, there occur two excesses. The one presupposes such perfection in Scripture, that all philosophy likewise should be derived from its sources; as if all other philosophy were something profane and heathen. This distemper has principally grown up in the school of Paracelsus and some others; but the beginnings thereof came from the Rabbis and Cabalists. But these men do not gain their object; and instead of giving honour to the Scriptures as they suppose, they rather embase and pollute them. For to seek the materiate heaven and earth in the word of God, (whereof it is said, "Heaven and earth shall pass away, but my word

shall not pass away"[1]), is rashly to seek for temporary things amongst eternal; and as to seek divinity in philosophy is to seek the living among the dead, so to seek philosophy in divinity is to seek the dead among the living. The other method of interpretation which I set down as an excess, appears at the first glance sober and modest, yet in reality it both dishonours the Scriptures themselves, and is very injurious to the Church. This is, (in a word,) when the divinely-inspired Scriptures are explained in the same way as human writings. But we ought to remember that there are two things which are known to God the author of the Scriptures, but unknown to man; namely, the secrets of the heart, and the successions of time. And therefore as the dictates of Scripture are written to the hearts of men, and comprehend the vicissitudes of all ages; with an eternal and certain foreknowledge of all heresies, contradictions, and differing and changing estates of the Church, as well in general as of the individual elect, they are not to be interpreted only according to the latitude and obvious sense of the place; or with respect to the occasion whereon the words were uttered; or in precise context with the words before or after; or in contemplation of the principal scope of the passage; but we must consider them to have in themselves, not only totally or collectively, but distributively also in clauses and words, infinite springs and streams of doctrines, to water every part of the Church and the souls of the faithful. For it has been well observed that the answers of our Saviour to many of the questions which were propounded to Him do not appear to the point, but as it were impertinent thereto. The reason

[1] St. Mark, xiii. 31.

whereof is twofold; the one, that knowing the thoughts of his questioners not as we men do by their words, but immediately and of himself, he answered their thoughts and not their words; the other, that He did not speak only to the persons then present, but to us also now living, and to men of every age and nation to whom the Gospel was to be preached. And this also holds good in other passages of Scripture.

Having made then these prefatory remarks, I come to that treatise which I pronounce deficient. There are found indeed among theological writings too many books of controversies, a great mass of that theology which I have termed Positive, common places, special tracts, cases of conscience, sermons and homilies, and many prolix commentaries upon the Scriptures. But what we want is a concise, sound, and judicious collection of annotations and observations on particular texts of Scripture; neither dilated into common places, nor chasing after controversies, nor reduced into method of art, but entirely unconnected and natural. It is indeed a thing sometimes found in the more learned sermons, which for the most part do not last; but not yet introduced into books, which may be handed down to posterity. But certainly, as wines which flow gently from the first treading of the grape are sweeter than those which are squeezed out by the wine-press; because these last have some taste of the stones and skin of the grape; so those doctrines are very sweet and healthy, which flow from a gentle pressure of the Scriptures, and are not wrested to controversies or common places. Such a treatise then I will denominate *the Emanations of the Scriptures.*

Now therefore have I made as it were a small globe of the intellectual world, as faithfully as I could; with a note and description of those parts which I find either not constantly occupied, or not well cultivated by the labour and industry of man. Wherein, if I have in any point receded from the opinion of the ancients, let it be understood that I have done so not from a desire of innovation or mere change, but of change for the better. For I could not be true and constant to myself or the argument I handle, if I had not determined to add as much as I could to the inventions of others; being however no less willing that my own inventions should be surpassed by posterity. But how fair I am in this matter may appear from this; that I have propounded my opinions everywhere naked and unarmed, without seeking to prejudice the liberty of men's judgments by disputes and confutations. For in anything which is well set down, I am in good hope that if the first reading move a scruple or objection, the second reading will of itself make an answer. And in those things wherein it has been my lot to err, I am sure I have not prejudiced the truth by litigious arguments; which commonly have this effect, that they add authority to error, and diminish the authority of that which is well invented; for question is an honour to falsehood, but it is a repulse to honour. Meanwhile I am reminded of the sarcastic reply of Themistocles to the ambassador, who coming from a small town used great words, "Friend, (said he) your words require a city."[1] And certainly it may be objected to me with truth, that my words require an age; a whole age perhaps to prove them, and many ages to perfect

[1] Lysander, not Themistocles. Cf. Plut. Lac. Apophthegmata.

them. But yet as even the greatest things are owing to their beginnings, it will be enough for me to have sown a seed for posterity and the Immortal God; whose Majesty I humbly implore through His Son and our Saviour that He will vouchsafe favourably to accept these and the like offerings of the human intellect, seasoned with religion as with salt, and sacrificed to His Glory.

THE END.

THE

NEW WORLD OF SCIENCES,

OR

DESIDERATA.

Book II.

The Errors of Nature, *or the History of Prætergenerations.*
The Bonds of Nature, *or Mechanical History.*
Inductive History, *or Natural History, properly arranged for a Foundation of Philosophy.*
The Eye of Polyphemus, *or the History of Learning.*
The History of Prophecy.
The Philosophy of the Ancient Fables.

Book III.

Primary Philosophy, *or a Treatise of the Common Axioms of the Sciences.*
Living Astronomy.
Sound Astrology.
A Continuation of Natural Problems.
The Opinions of Ancient Philosophers.
The Part of Metaphysic which relates to the Forms of Things.
Natural Magic, *or the Deduction of Forms to Works.*

An Inventory of Human Possessions.
A Catalogue of Things of Multifarious Use.

Book IV.

The Triumphs of Man, *or, A Treatise of the Ultimate Perfections of Human Nature.*
The Physiognomy of the Body in Motion.
Medical Reports.
Comparative Anatomy.
On the Treatment of Diseases pronounced Incurable.
On the Means for rendering Death easy to the Body.
On Authentic Medicines.
An Imitation of Natural Hot Springs.
The Physician's Clue.
On the Prolongation of Life.
On the Substance of the Sensible Soul.
On the Efforts of the Spirit in Voluntary Motion.
On the Difference between Sense and Perception.
The Root of Perspective, or, A Treatise of the Form of Light.

Book V.

The Hunt of Pan, *or Learned Experience.*
The Novum Organum, or New Instrument of Logic.
Particular Topics, or Heads of Inquiry.
Confutations of Sophisms and Idols.
On the Analogy of Demonstrations.

Book VI.

On the Notes of Things.
A Philosophical Grammar.

The Tradition of the Lamp, *or the Method of Delivery to Posterity.*

On Prudence in Private Discourse.

The Colours of Apparent Good and Evil, both Simple and Comparative.

The Antitheta of Things.

The Lesser Formulæ of Speech.

Book VII.

Serious Satire, *or the Inner Natures of Things.*

The Georgics of the Mind, *or the Culture of Morals.*

Book VIII.

The Secretary for the Affairs of Life, *or, On Scattered Occasions.*

The Carpenter of Fortune, *or, On Advancement in Life.*

The Statesman in Armour, *or, On the Means of Extending an Empire.*

The Idea of Universal Justice, or, On the Fountains of Equity.

Book IX.

Sophron, *or, On the Legitimate Use of Human Reason in Divinity.*

Irenæus, *or, On the Degrees of Unity in the Kingdom of God.*

Celestial Vessels, *or Emanations of the Scriptures.*

NATURAL AND EXPERIMENTAL HISTORY

FOR THE FOUNDATION OF PHILOSOPHY:

OR

PHENOMENA OF THE UNIVERSE:

BEING THE THIRD PART OF THE INSTAURATIO MAGNA.

BY

FRANCIS

BARON OF VERULAM,

AND VISCOUNT ST. ALBANS.

TO THE MOST ILLUSTRIOUS AND EXCELLENT

PRINCE CHARLES,

SON AND HEIR OF HIS MOST SERENE MAJESTY, KING JAMES.

Most Illustrious and Excellent Prince,

THE first fruits of my Natural History I most humbly offer to your Highness; a thing like a grain of mustard-seed, very small in itself, yet a pledge of those things which by the grace of God will come hereafter. For I have bound myself as by a vow every month that the goodness of God (whose glory is sung as in a new song) shall add to my life, to complete and set forth one or more parts of it, according as they be more or less difficult or extensive. It may be also that others will be stirred by my example to a like industry; especially when they shall fully understand what it is that we are about. For a sound and well-ordered Natural History is the key of all knowledge and operation. That God may long preserve your Highness in His keeping is the prayer of

Your Majesty's humble and devoted Servant,

FR. ST. ALBAN.

TITLES OF THE HISTORIES AND INQUIRIES DESIGNED FOR THE FIRST SIX MONTHS.

History of the Winds.
History of Dense and Rare, and of the Contraction and Expansion of Matter in Space.
History of Heavy and Light.
History of the Sympathy and Antipathy of Things.
History of Sulphur, Mercury, and Salt.
History of Life and Death.

THE NATURAL AND EXPERIMENTAL HISTORY FOR THE FOUNDATION OF PHILOSOPHY:

OR

PHENOMENA OF THE UNIVERSE:

WHICH IS THE THIRD PART OF THE INSTAURATIO MAGNA.

MEN are to be admonished, nay urged and entreated as they value their fortunes, to be lowly of mind and search for knowledge in the greater world, and to throw aside all thought of philosophy, or at least to expect but little and poor fruit from it, until an approved and careful Natural and Experimental History be prepared and constructed. For to what purpose are these brain-creations and idle displays of power? In ancient times there were philosophical doctrines in plenty; doctrines of Pythagoras, Philolaus, Xenophanes, Heraclitus, Empedocles, Parmenides, Anaxagoras, Leucippus, Democritus, Plato, Aristotle, Zeno, and others. All these invented systems of the universe, each according to his own fancy, like so many arguments of plays; and those their inventions they recited and published; whereof some were more elegant and probable, others harsh and unlikely. Nor in our age, though by reason of the institutions of schools and colleges wits are more restrained, has the

practice entirely ceased; for Patricius, Telesius, Brunus, Severinus the Dane, Gilbert the Englishman, and Campanella have come upon the stage with fresh stories, neither honoured by approbation nor elegant in argument. Are we then to wonder at this, as if there would not be innumerable sects and opinions of this kind in all ages? There is not and never will be an end or limit to this; one catches at one thing, another at another; each has his favourite fancy; pure and open light there is none; every one philosophises out of the cells of his own imagination, as out of Plato's cave; the higher wits with more acuteness and felicity, the duller, less happily but with equal pertinacity. And now of late by the regulation of some learned and (as things now are) excellent men (the former variety and licence having I suppose become wearisome), the sciences are confined to certain and prescribed authors, and thus restrained are imposed upon the old and instilled into the young; so that now (to use the sarcasm of Cicero concerning Cæsar's year),[1] the constellation of Lyra rises by edict, and authority is taken for truth, not truth for authority. Which kind of institution and discipline is excellent for present use, but precludes all prospect of improvement. For we copy the sin of our first parents while we suffer for it. They wished to be like God, but their posterity wish to be even greater. For we create worlds, we direct and domineer over nature, we will have it that all things *are* as in our folly we think they should be, not as seems fittest to the Divine wisdom, or as they are found to be in fact; and I know not whether we more distort the facts of nature or our own wits; but we clearly im-

[1] Plut. in Jul. Cæs. p. 735.

press the stamp of our own image on the creatures and works of God, instead of carefully examining and recognising in them the stamp of the Creator himself. Wherefore our dominion over creatures is a second time forfeited, not undeservedly; and whereas after the fall of man some power over the resistance of creatures was still left to him — the power of subduing and managing them by true and solid arts — yet this too through our insolence, and because we desire to be like God and to follow the dictates of our own reason, we in great part lose. If therefore there be any humility towards the Creator, any reverence for or disposition to magnify His works, any charity for man and anxiety to relieve his sorrows and necessities, any love of truth in nature, any hatred of darkness, any desire for the purification of the understanding, we must entreat men again and again to discard, or at least set apart for a while, these volatile and preposterous philosophies, which have preferred theses to hypotheses, led experience captive, and triumphed over the works of God; and to approach with humility and veneration to unroll the volume of Creation, to linger and meditate therein, and with minds washed clean from opinions to study it in purity and integrity. For this is that sound and language which went forth into all lands,[1] and did not incur the confusion of Babel; this should men study to be perfect in, and becoming again as little children condescend to take the alphabet of it into their hands, and spare no pains to search and unravel the interpretation thereof, but pursue it strenuously and persevere even unto death.

Having therefore in my Instauration placed the Nat-

[1] Psalm ix. 4.

ural History — such a Natural History as may serve my purpose — in the third part of the work, I have thought it right to make some anticipation thereof, and to enter upon it at once. For although not a few things, and those among the most important, still remain to be completed in my Organum, yet my design is rather to advance the universal work of Instauration in many things, than to perfect it in a few; ever earnestly desiring, with such a passion as we believe God alone inspires, that this which has been hitherto unattempted may not now be attempted in vain. It has occurred to me likewise, that there are doubtless many wits scattered over Europe, capacious, open, lofty, subtle, solid, and constant. What if one of them were to enter into the plan of my Organum and try to use it? he yet knows not what to do, nor how to prepare and address himself to the work of philosophy. If indeed it were a thing that could be accomplished by the reading of philosophical books, or discussion, or meditation, he might be equal to the work, whoever he be, and discharge it well; but if I refer him to natural history and the experiments of arts (as in fact I do), it is out of his line, he has not leisure for it, he cannot afford the expense. Yet I would not ask any one to give up what he has until he can exchange it for something better. But when a true and copious history of nature and the arts shall have been once collected and digested, and when it shall have been set forth and unfolded before men's eyes, then will there be good hope that those great wits I spoke of before, such as flourished in the old philosophers, and are even still often to be found — wits so vigorous that out of a mere plank or shell (that is out of scanty and trifling expe-

rience) they could frame certain barks of philosophy, of admirable construction as far as the work is concerned — after they have obtained proper material and provision will raise much more solid structures; and that too though they prefer to walk on in the old path, and not by the way of my Organum, which in my estimation if not the only is at least the best course. It comes therefore to this; that my Organum, even if it were completed, would not without the Natural History much advance the Instauration of the Sciences, whereas the Natural History without the Organum would advance it not a little. And therefore, I have thought it better and wiser by all means and above all things to apply myself to this work. May God, the Founder, Preserver, and Renewer of the universe, in His love and compassion to men, protect and rule this work both in its ascent to His glory and in its descent to the good of man, through His only Son, God with us.

THE RULE OF THE PRESENT HISTORY.

ALTHOUGH at the end of that part of my Organum which has been published precepts are laid down concerning Natural and Experimental History, yet I think it right to give a description at once more exact and more succinct of the rule and structure of the History I am now entering upon.

To the Titles contained in the Catalogue which relate to Concretes, I superadd Titles of Abstract Natures (which I have mentioned there as a History reserved for myself). Such are "The Different Configurations of Matter," or "Forms of the First Class," "Simple Motions," "Sums of Motions," "Measures of Motions," and some other things; whereof I have constructed a new Alphabet, and placed it at the end of this volume.

The titles in the catalogue (seeing it is beyond my power to handle them all) I have not taken in order, but made a selection; choosing those whereof the inquiry was either most important in respect of use, or most convenient on account of the abundance of experiments, or most difficult and noble from the obscurity of the thing, or such as opened the widest fields for examples by reason of the difference between the several titles, compared one with the other.

In each Title, after an Introduction or Preface, Particular Topics or Articles of Inquiry are immediately proposed, as well to give light in the present, as to stimulate further inquiry. For questions are at our command, though facts are not. I do not however in the history itself tie myself to the precise order of the questions, lest what was meant for a help should become a hindrance.

The History and Experiments occupy the first place. These, if they exhibit an enumeration and series of particular things, are collected into tables; otherwise they are taken separately.

Since history and experiments very often fail us, especially those Experiments of Light and Crucial Instances by which the understanding may determine on the true causes of things, I give Injunctions touching new experiments contrived, as far as can be at present foreseen, to meet the special object of inquiry. And such Injunctions form a kind of Designed History. For what other course is open to us on first entering on our path?

In the case of any more subtle experiment the method which I have employed is explained; for there may be a mistake, and it may stimulate others to devise better and more exact methods.

Admonitions and cautions concerning the fallacies of things, and the errors and scruples which may occur in inquiry and discovery, are interspersed; to dispel and as it were exorcise as much as possible all delusions and false appearances.

I insert my own observations on the history and experiments, that the interpretation of nature may the more advance.

Speculations, and what may be called rudiments of interpretation concerning causes, are introduced sparingly, and rather as suggesting what the cause may be than defining what it is.

Such Rules or imperfect axioms as occur to us in the course of inquiry, and where we do not yet pronounce, we set down and prescribe, but only provisionally. For they are useful, if not altogether true.

Never forgetful likewise of the good of man (though the light itself is more worthy than the things which it reveals), I append some Reminders concerning Practice for the attention and remembrance of men. For such and so unfortunate, I well know, is the insensibility of mankind, that sometimes, if they be not warned, they will pass by and neglect things which lie in their very path.

Works and Things Impossible, or at least not yet discovered, are propounded according as they fall under the several titles. And along with them those discoveries of which man is already possessed, which are nearest and most akin to such impossibles; that men's industry may be excited and their spirits encouraged.

It is evident from what has been said that the present history not only supplies the place of the third part of the Instauration; but is no mean preparation for the fourth part, by reason of the titles from the Alphabet, and the Topics; and for the sixth part, by reason of the major observations, the speculations, and the provisional rules.

THE

HISTORY OF THE WINDS:

OR

THE FIRST TITLE IN THE NATURAL AND EXPERIMENTAL HISTORY,

FOR THE FOUNDATION OF PHILOSOPHY:

WHICH IS THE THIRD PART OF THE INSTAURATIO MAGNA.

HISTORY OF THE WINDS.

INTRODUCTION OR PREFACE.

To men the winds are as wings. For by them men are borne and fly, not indeed through the air but over the sea; a vast gate of commerce is opened, and the whole world is rendered accessible. To the earth, which is the seat and habitation of men, they serve for brooms, sweeping and cleansing both it and the air itself. Yet they damage the character of the sea, which would otherwise be calm and harmless; and in other respects they are productive of mischief. Without any human agency they cause strong and violent motion; whence they are as hired servants to drive ships and turn mills, and may, if human industry fail not, be employed for many other purposes. The nature of the winds is generally ranked among the things mysterious and concealed; and no wonder, when the power and nature of the air, which the winds attend and serve (as represented by the poets in the relation of Æolus to Juno), is entirely unknown. They are not primary creatures, nor among the works of the six days; as neither are the other meteors actually; but produced according to the order of creation.

PARTICULAR TOPICS;

OR

Articles of Inquiry concerning the Winds.

1. Describe the winds according to the method observed at sea, and give them names either ancient or modern; but let them be constant and invariable.

The Names of Winds.

Winds are either General, Periodical, Attendant, or Free. By the General winds, I mean those which blow always; by the Periodical, I mean those which blow at certain times; by the Attendant, those which blow more frequently; and by the Free, those which blow indifferently.

2. Are there any general winds and actual motions of the air? If such things be, in what order of motion, and in what places do they blow?

General Winds.

3. What winds are annual, or periodical, and in what countries? Is any wind so precisely periodical as to return regularly on certain days and hours like the tide of the sea?

Periodical Winds.

4. What winds are attendant and haunters of particular regions? at what times do they blow in those regions? what winds blow in the spring, summer, autumn, and winter? which are equinoctial, and which solstitial winds? which are morning, which noonday, which evening, and which night winds?

Attendant Winds.

5. What is the nature of sea winds, and what that of land winds? And here carefully mark the differences between sea and land winds, as well those which blow on as those which blow from the sea and land.

6. Are there not winds blowing from every quarter of the heaven?

Free Winds.

WINDS do not vary much more in the quarters they blow from than in their qualities. Some are strong, others gentle; some constant, others variable; some hot, others cold; some moist and relaxing, others dry and binding; some collect clouds and are rainy or stormy, others disperse them and are fair.

7. Inquire and report to which of the forementioned kinds each wind belongs, and how they vary according to countries and places.

The Different Qualities of Winds.

THE local origins of winds are three in number; for they are either sent down from above, or they spring out of the earth, or they are collected in the body of the air.

8. Inquire of the winds according to these three origins; namely, which of them are sent down from what is termed the middle region of the air; which breathe forth from the hollows of the earth, whether they rush out in a body, or exhale imperceptibly and by degrees, and then collect as streams into a river; lastly, which of them are generated indiscriminately by the swelling or expansion of the contiguous air?

The Local Origins of Winds.

The generations of the winds are not only ori
but also accidental; that is, arising from the com
sions, percussions, and repercussions of the air.

9. Inquire into these accidental generations o
Accidental Generations of Winds winds. Properly they are not genera
for they rather increase and strengthe
winds than create and excite them.

So much then for the community of winds.
there are some extraordinary and prodigious w
as fiery winds, whirlwinds, and hurricanes. T
prevail on earth. But there are likewise su
ranean winds, whereof some are vaporous and
curial; as are felt in mines; others are sulphur
and find vent in earthquakes, or burst out from
canoes.

10. Inquire into these extraordinary and prodi
Extraordinary Winds, and Sudden Gusts. winds, and into all the wonderful pr
ties of winds.

From the kinds of winds let the inquiry pass
the things which help to produce them (I do nc
efficients of them, for that is more than I mean
concomitants, for that is less, but *confacients*, t
which help to make them); and those which are
posed to excite or calm them.

11. Of astrological considerations touching the
The Things Contributing to Winds, which excite or appease them. inquire sparingly, and take no heed
curate horoscopes of the heaven; on
not neglect the more evident observ
of the winds increasing at the rising o
tain stars, at the eclipses of luminari
at the conjunctions of planets; and

far they depend on the paths of the sun or moon.

12. What do meteors of different kinds contribute to the winds? What do earthquakes, showers, and the meeting of the winds together, contribute? For these things are linked together, and depend one upon the other.

13. What do different vapours and exhalations contribute? which of them is most productive of winds, and how far is the nature of winds influenced by their matter?

14. What do earthly things and things which take place on earth contribute to the winds? What do mountains and the melting of snow upon them, or vast icebergs which float and are borne about in the sea everywhere, contribute? What do the differences of soil or land (if in large tracts), as marshes, sands, woods, plains, contribute? What the work done by the hand of man, as the burnings of heath and the like for the cultivation of land; the burnings of corn and villages in wars; the draining of marshes; the perpetual discharges of cannon; and the ringing of bells in great cities? Such matters indeed appear trivial, but yet they have some influence.

15. Inquire into all the methods of exciting or calming the winds, but less fully into such as are fabulous or superstitious.

From this let the inquiry pass on to the limits of the winds in point of height, extension, and duration.

16. Inquire carefully into the height or elevati
The Limits of Winds. the winds, and if there be any mou
tops where they do not blow; or if
clouds sometimes appear motionless an
tionary, at the same time that the winc
blowing strong on the earth.

17. Inquire carefully touching the space which
have been known to occupy at the
time, and what are the boundaries of
For instance, if a south wind is blowi
such a place, will a north wind be bl
at the same time ten miles distant
thence? On the other hand, in how
a compass can winds be confined, so
(as is the case in some whirlwinds) the
pear to run in channels.

18. Inquire touching the greatest, mean, or sh
time, that the winds are wont to con
before they slacken and as it were ex
what again is their usual manner of
and commencing, what of falling and
ing? whether it be sudden, or gradu
how?

From the limits of the winds let the inquiry pa
to their successions, either among themselves, or
respect to rain and showers. For as they perf
dance, it would be pleasant to know the order of

19. Is there any rule or any observation whic
The Successions of Winds. be at all relied on for the succession
winds with one another? Is it in con
ity with the motion of the sun or not
there is a rule, what is the nature of

20. Inquire into the succession and alternation of the winds and rain; for the common and familiar idea is that rain calms the winds, and winds keep off and disperse the rain.

21. Is the same succession of the winds repeated after a certain period of years? if so, what is that period?

From the successions of the winds let the inquiry pass on to their motions. These motions involve seven inquiries; whereof three are contained in the former articles, the other four remain untouched. For I have already inquired of the motion of the winds as distributed according to the different points of the compass; of the three lines of motion, upwards, downwards, and sideways; and of the accidental motion of compressions. There remain therefore, the motion of progression, the motion of undulation, the motion of conflict, and the motion in organs and machines of human invention.

The Different Motions of Winds.

22. Since progression always begins from a certain point, inquire as diligently as possible into the place of the first rising, and as it were the fountains of the winds. For winds appear to resemble Fame; which though they penetrate and bluster everywhere, yet hide their heads in the clouds.[1] Inquire likewise into the progression itself. For instance, if a strong north wind blew on such a day or such an hour at York, did it blow two days afterwards in London?

[1] Virg. Æn. iv. 173.

23. Omit not to inquire into the undulation of the winds. By undulation I mean that motion by which the wind, like the waves of the sea, is increased or slackened for short intervals; the alternations whereof are best perceived by listening in buildings. But the differences between the undulations or furrowings of air and water should be the more carefully marked, because in the air and winds there is no motion of gravity, which is a great part of the undulation in water.
24. Inquire carefully into the conflict and concurrence of winds blowing at the same time. First whether many original winds (not reverberating) can blow at the same time? And if so, what channels they form in their motion, and what condensations and alterations they engender in the body of the air.
25. Do some winds blow above at the same time that others blow below? For some have observed that the clouds sometimes move in a contrary direction to the weathercock; and likewise are sometimes driven by a strong breeze, when it is quite calm below.
26. Describe very carefully and particularly the motion of the winds in the sailing of ships.
27. Describe the motion of the winds in the sails of windmills, in the flight of hawks and birds, and even in playthings and common matters, as in the waving of banners, the flying of kites, and games which depend on the wind.

FROM the motions of the winds let the inquiry pass on to their force and powers.

The Powers of Winds.

28. What are the powers and actions of the winds on tides and currents, as to keeping them back, driving them on, and causing them to overflow?

29. What are their powers over plants and insects, with regard to bringing locusts, caterpillars, blights, and mildews?

30. What have they to do with purifying and infecting the air, with regard to pestilences, epidemics, and affections of animals?

31. What is their power of conveying what are termed spiritual species, that is, sounds, radiations, and the like?

From the powers of winds let the inquiry pass on to their prognostics, not only on account of the use of predictions, but because they lead the way to causes. For prognostics show either the preparations of things before they are produced into action, or their commencements before they are perceptible to the sense.

Prognostics of Winds.

32. Diligently collect all kinds of prognostics of winds (except those of an astrological nature, the proper inquiry whereof has already been marked out), whether they be sought from the sky, waters, the instinct of animals, or any other source.

LASTLY, conclude the inquiry by investigating the imitations of winds in things natural or artificial.

Imitations of Winds.

33. Inquire into the imitations of winds in natural bodies, as flatulency in the bodies of ani-

mals, explosions in the receivers of s
and the like.

Inquire into draughts and artificial winds, as
lows, ventilators in rooms, &c.

Such then are the articles of inquiry. Some of t
I am well aware, it is beyond the power of our pr
experience to answer. But as in civil trials a
lawyer knows how to put questions suitable to the
but knows not what the witnesses can answer; so
with us in Natural History. Let posterity look t
rest.

THE HISTORY.

The Names of Winds.

With reference to the 1st Article of Inquiry.

For the sake of clearness and to assis
memory, we give a new set of names t
winds according to their order and degrees, instea
using the old proper names. But since I have
rowed many terms (though not without careful sift
from the opinions of the ancients, and things will h
be recognized except under the ancient names, t
likewise are annexed to the winds. Let the ge
division of the winds be as follows: Cardinal W
which blow from the cardinal points of heaven; S
cardinal, which blow half way between those po
and Median, which blow intermediate between t
again. And of these Median winds let those be c
the Greater Medians which blow half way betwee
Cardinal and Semi-cardinal, and the rest the L
Medians.

The particular division of the winds is shown in the following table: —

Cardinal.	North: anciently called Boreas. North and by East.	East: anciently called Eurus or Subsolanus. East and by South.	South: anciently called Auster or Notus. South and by West.	West: anciently called Zephyrus or Favonius. West and by North.
Greater Med.	North-North-East: anciently called Aquilo. North-East and by North: anciently called Meses.	East-South-East: anciently called Vulturnus. South-East and by East.	South-South-West: anciently called Libonotus. South-West and by South.	West-North-West: anciently called Corus. North-West and by West.
Semi-Card.	North-East: North-East and by East.	South-East: South-East and by South.	South-West: anciently called Libs. South-West and by West.	North-West: North-West and by North: anciently called Thrascias.
Greater Med.	East-North-East: anciently called Cæcias. East and by North.	South-South-East: anciently called Phœnicias. South and by East.	West-South-West: anciently called Africus. West and by South.	North-North-West: anciently called Circias. North and by West.

There are also other ancient names for winds, as Apeliotes the East wind, Argestes the West-North-West, Olympias and Scyron the North-West, Hellespontius the East-North-East, and Iapyx the West-North-West; but I do not dwell upon them. Let it be enough to have given fixed names to the winds, according to the order and division of the quarters of the heaven. In the interpretation of authors I place no great confidence; for they are themselves of but little weight.

Free Winds.

With reference to the 6th Article of Inquiry.

1. There is no point of the heaven whence a wind may not blow. Nay, if the heavens were divided into as many parts as there are degrees in the horizon, winds will be found at some times or places blowing from each of them.

2. There are whole countries in which it never rains, or at all events very seldom; but there are no countries where it does not blow, and that often.

General Winds.

With reference to the 2nd Article of Inquiry.

The phenomena with respect to the eral winds are few in number; an wonder, for these winds principally in the tropics, regions considered fatal by the cients.

1. Persons sailing in the open sea between the ics are aware of a steady and continual wind (c by the sailors *Brize*) blowing from East to West. wind is so strong, that partly by its own blast, partly by its influence on the current, it prevents sels sailing to Peru from returning by the same w

2. In the European seas, when the sky is calm clear, and no particular winds are stirring, there gentle breeze from the East, following the sun.

3. It is generally observed that the higher c move mostly from East to West; and this even a same time that there is a calm or a contrary below. If this is not always the case, the reason be that particular winds sometimes blow high up, v overpower this general wind.

Admonition.

If there be any such general wind fo ing the motion of the heaven, it is not strong en to resist particular winds. Such a wind is mor servable in the tropics, because it moves the larger circles; and also in the higher regions o air for the same reason, and because it has th free course. Wherefore if you would discov outside the tropics, and near the earth (where very gentle and inactive), make the experime the open air, in a perfect calm, on high ground,

[1] Acosta, Hist. des Indes, iii. 4.

a body very susceptible of motion, and towards evening; because at that time the particular east wind does not blow so much.

Injunction. Observe carefully whether the weathercocks and vanes on the tops of towers and steeples do not in the most perfect calms point steadily to the west.

4. It is certain that in Europe the east wind is sharp and drying, the west wind moist and genial. Is not this because (assuming that the air moves from east to west) the east wind, which moves in the same direction, must rarify and dissipate the air; and so make it dry and biting; whereas the west wind which moves in a contrary direction collects and condenses the air; which thereby becomes less keen, and in the end wet?

Indirect phenomena.

5. Consult the inquiry into the motion of the tides, as to whether they move from east to west. For if the heaven and the waters which are the extremes prefer this motion, it is not unlikely that the air which lies between them will likewise partake of it.

Admonition. These two phenomena last mentioned are termed indirect, because they exhibit the matter in question not directly, but by consequence: a kind of evidence which (in the absence of direct phenomena) I eagerly receive.

Injunction. That this Brize blows perceptibly in the tropics is a certain fact, but the cause of it is doubtful. It may be that it is because the air moves as the heavens do; only that outside the tropics the motion is almost imperceptible by reason of the smaller circles, whereas it is manifest within them where the circles are larger. Or it

may be that as all air is expanded by heat, can no longer be contained in the same space contiguous air is necessarily impelled by the pansion, and produces this brize as the sun vances. But within the tropics, where the sur greater power, this is more remarkable; wit them, it is hardly perceptible. By way of a cial Instance to decide the point, inquire wh the brize blows at night or not. For the rotatic the air continues by night, but the heat of the does not.

6. But it is certain that this brize does not blo the night, but that it blows in the morning and some time after sunrise. Nevertheless this does terminate the inquiry. For the nocturnal cond tion of the air, especially in those countries where days and nights are not more equal in their lei than they are different in their degrees of heat cold, may weaken and disturb this natural but f motion of the air.

7. If the air participates in the motion of the hea it follows, not only that the east wind is concu with the motion of the air, and the west wind is posed thereto; but also that the north wind blows were from above and the south wind as it were below in our hemisphere, where the north pole is r above the earth and the south depressed belo And this has ever been remarked by the anci though with hesitation and obscurity; but it ag well with modern experience; because this (which may be a motion of the air) is not due but north-east.

Periodical Winds.

With reference to the 3rd Article of Inquiry.

Transition.

As in the inquiry touching the General winds men have been afflicted with blindness, so in that of the Periodical winds, they have suffered dizziness and confusion. Of the former they say nothing, of the latter they talk vaguely and incoherently. But this is the more pardonable, because the thing is variable. For periodical winds change with the place, and the same do not blow in Egypt, Greece, and Italy.

1. That there are periodical winds in some places the application of the name declares, as well as that other appellation of Etesian or Anniversary winds.

2. It has been set down by the ancients as one of the causes of the inundation of the Nile, that at that time of the year the Etesian or North winds are prevalent, which prevent the river from running into the sea, and drive it back.[1]

3. There are currents in the sea, which can neither be attributed to the natural motion of the ocean, nor to a descent from higher ground, nor to the narrowness of channels, nor to promontories jutting out into the sea; but which are plainly influenced by periodical winds.

4. Those who are unwilling to admit that Columbus conceived so certain and fixed an opinion of the West Indies from the narrative of a Spanish pilot, and consider it still more unlikely that he derived it from the obscure vestiges and rumours of antiquity, take refuge in this; that from periodical winds blowing to the coast of Portugal, he imagined that there was a continent

[1] Herod. ii. 20., and Pliny, v. 10.

to the westward. The circumstance is doubtful and not very probable, since the winds could hardly travel so great a distance; but in the meantime it is a great honour to this inquiry, if the discovery of the new world may be attributed to one out of the many axioms or observations that it contains.

5. Wherever there are high mountains covered with snow, periodical winds blow from that quarter at the time of the melting of the snows.

6. I judge also that from large marshes, which in winter time are entirely flooded, there blow periodical winds at the time when the heat of the sun commences to dry them; but of this I have no certain information.

7. Wherever there is a plentiful generation of vapours, and that at certain times, you may be sure that at those times periodical winds will arise there.

8. If periodical winds are blowing anywhere, and there be no cause for them to be discovered near at hand, you may know that such periodical winds are strangers and come from a distance.

9. It has been remarked that periodical winds do not blow at night, but get up the third hour after sunrise. They appear indeed like winds tired with a long journey, so as to be scarce able to break through the condensation of the night air, but after sunrise they are roused up for a while and continue on their course.

10. All periodical winds (except they rise near at hand) are weak, and easily overpowered by winds that rise suddenly.

11. There are many periodical winds which are neither perceived nor observed, by reason of their weakness and their being overpowered by the free winds.

In the winter time therefore, when the free winds are most prevalent, they are scarce perceptible; but in the summer, when these wandering winds are less frequent, they are more apparent.

12. In Europe the principal periodical winds are, northerly winds from the solstice, both before and after the rising of the dog-star; west winds from the autumnal equinox; and east winds from the vernal equinox;[1] for the winter solstice deserves less attention by reason of the frequent changes in winter.

13. The Ornithian or Bird-winds (so called because they bring birds from cold regions beyond the sea to more sunny climes) have nothing to do with periodical winds; for they often fail in point of time. But whether they blow late or early, the birds wait for their convoy; and if, as often happens, the winds commence to blow and then change again, the birds being deprived of their help drop into the sea, and sometimes fall upon ships.

14. The precise day or hour of the return of the winds is not discovered as it is in the tides. Some writers sometimes specify a day, but it is rather by conjecture than constant observation.

Attendant Winds.

With reference to the 4th and 5th Articles of Inquiry. Transition.

This term of Attendant Winds is my own; and I have invented it lest the observation of them be forgotten or confused. My meaning is this. Take any country and divide the year into three, four, or five parts. If any wind blows there for two, three, or four of these parts, and a contrary wind for only one part, the wind which blows

[1] Pliny, ii. 47, 48.

oftenest is called the attendant wind of that country. And the same is the case with respect to the weather.

1. The south and north winds are the attendant winds of the world; for they with their divisions blow more frequently over the world than the east or west winds with their divisions.

2. All free winds (not periodical) are attendants of the winter rather than the summer, but principally of the autumn and spring.

3. All free winds attend more upon the regions without the tropics, and even the polar circles, than those within them; in the torrid and frigid zones they blow more seldom, in the temperate more frequently.

4. All free winds likewise, and especially the strongest of them, blow oftener and more violently in the morning and evening than at noon and night.

5. Free winds are more general in lands full of holes and cavities than on solid and firm soils.

Injunction. Human care has been very remiss in the observation of attendant winds in particular districts; yet such observation, if it were made, would be useful in many respects. I remember that an intelligent merchant who had carried out a colony to Newfoundland and passed the winter there, told me, when I asked him why that country was reputed so extremely cold where the latitude was sufficiently mild, "that it was not quite so bad as was reported, but that the reasons were two: the one, that icebergs were brought down by the current of the Arctic Sea close beside those shores; the other" (which he considered the more important), "that the west wind blows there for a much greater part of the

year than the east; which is likewise the case (said he) in England; but then in Newfoundland it blows cold from the continent, here it comes warm from the sea. Now if," he continued, "the east wind blew as long and as frequently in England as the west wind blows in Newfoundland, the cold here would be far more intense, and equal to what it is there."

6. The west wind is the attendant of the afternoon, for it blows more frequently than the east wind when the sun is declining.

7. The south wind is the attendant of the night, for it rises oftener in the night, and blows stronger. The north wind blows in the daytime.

8. There are many great differences between the attendant winds of the sea and those of the land. The chief one is that which suggested to Columbus the discovery of the New World; namely, that sea winds are not periodical as land winds generally are. For since the sea abounds with vapours, which are present everywhere almost indifferently, winds likewise are generated everywhere, and having no fixed origins and birthplaces blow every way with great uncertainty. But the land is very unequally provided with the matter of winds; some places being well supplied with the means of generating and increasing them, others comparatively deficient. And therefore they commonly blow from their nurseries, and take their direction accordingly.

9. Acosta does not appear to be very consistent, when he says in one place that south winds blow during almost the whole year in Peru and along the coasts of the South Sea, and in another that sea-winds generally

blow there.[1] For the south wind there is a land wind, as also is every other wind except the west. We may adopt however what he observes as more certain, namely, that the south wind is the attendant and common wind of those countries; unless perchance his imagination or manner of speaking were betrayed into error by the name of the South Sea; and he takes the west wind, because it blows from the South Sea, for the south. For the sea termed the South Sea is not properly the South Sea, but as it were a second Western Ocean; for it stretches in the same direction as the Atlantic.

10. Sea winds are doubtless moister than land winds, but yet purer, and more easily and equally mixed with pure air. For land winds are compounded of deleterious mixtures, and are full of smoke. And let no one oppose to this, that sea winds must be heavier by reason of the saltness of the sea; for salt being in its nature terrestrial does not rise in vapours.

11. Sea winds are warm or cold, according as they are moist or pure. Cold is lessened by humidity (for dryness intensifies both heat and cold), but increased by purity. Therefore these winds are warm outside the tropics, but cool within them.

12. I judge that sea winds are the attendant winds of all countries, especially on the coast. For winds from the sea are much more common, by reason of the far greater abundance of matter for winds at sea than on land; unless perchance from some peculiar cause there happen to be a periodical wind blowing from the land. But let no one confuse periodical and attendant winds together; for the latter blow much more gener-

[1] Acosta, Hist. des Indes, iii. 20., and ii. 13.

ally than the former. They have however this in common, that they blow from the quarter where they are bred.

13. Sea winds are generally more violent than land winds; yet when they subside the calm is greater out at sea than near shore; so that sailors sometimes prefer rather to coast along the shore than to venture out to sea, lest they should be becalmed.

14. There blow from the sea to the shore winds which are intermittent; that is, winds which advance a little way, and then suddenly turn back. This surely is caused by a kind of refraction and inequality between the breezes of the sea and of the land; for all inequality of the air is a commencement of wind. Such intermittent and eddying winds are most frequent in bays and arms of the sea.

15. Some breezes generally blow about all great waters, and are mostly perceptible in the morning; but they appear more about rivers than at sea, by reason of the difference between the breeze from the land and from the water.

16. Trees growing near the sea usually bend and curve themselves away from the sea breezes, as if they had an antipathy thereto. Not however that these winds have any deleterious quality, but their moistness and density render them as it were heavier.

The Qualities and Powers of Winds.

With reference to the 7th, 27th, 28th. 29th 30th, and 31st Articles of Inquiry.

Transition.

The qualities and powers of the winds have not been observed diligently and variously. I will extract the more certain of them, and leave the rest as frivolous to the winds themselves.

1. The south wind with us is rainy, the north wind clear; the former collects and nurtures clouds, the latter breaks and dissipates them. Poets therefore in their descriptions of the deluge represent the north wind as at that time imprisoned, and the south wind let loose with full powers.

2. The west wind is reputed by us as the wind of the Golden Age, the companion of perpetual spring, and the nurse of flowers.

3. The school of Paracelsus, seeking a place for its three principles even in the temple of Juno, that is the air, established three winds. For the east they found no place.

> Tincturis liquidum qui mercurialibus Austrum,
> Divitis et Zephyri rorantes sulphure venas,
> Et Boream tristi rigidum sale.[1]

4. In Britain the east wind is considered injurious, insomuch that there is a proverb,

> "When the wind is in the east,
> 'Tis neither good for man nor beast."

5. In our hemisphere the south wind blows from the quarter where the sun is, the north wind from the quarter where it is not. The east wind everywhere follows the motion of the air, the west wind opposes it. In most parts of Europe and Western Asia the west wind blows from the sea, the east from the land. These are the most radical differences of the winds, whereon most of their qualities and powers really depend.

6. The south wind is less anniversary and periodical

[1] Johannes Pratensis:

> Clear Auster with mercurial tinct imbued,
> Rich Zephyr dewed with sulphur, Boreas drear
> Rigid with salt.

than the north wind, but more variable and free ;[1] and when it is periodical it is so gentle as to be scarce perceptible.

7. The south wind blows lower and more laterally; the north wind higher and more from above. And this is not in consequence of the polar elevation and depression mentioned above, but because the south wind in general has its birthplace nearer the earth than the north wind.

8. The south wind with us is wet (as has been observed before) ; but in Africa it is fair and brings great heats, and is not cold, as some have affirmed.[2] In Africa it is tolerably healthy, but here if a clear and dry south wind continue long, it is very pestilential.

9. The south and west winds do not generate vapours, but as they blow from quarters where the greatest quantity of vapours is drawn forth by the intensity of the sun's heat, they are rainy. If however they proceed from dry places that are free from vapours, they are fair, sometimes pure, and sometimes sultry.

10. The south and west winds with us seem to be allied, being both warm and moist; and on the other hand the north and east are related, being both cold and dry.

11. The north and south winds (as has been observed before) are more frequent than the east and west; because by reason of the presence and absence of the sun in those parts there is a vast inequality of vapours; whereas in the east and west the sun is as it were indifferent.[3]

12. The south wind from the sea is very healthy, but

[1] Aristot. Problem. § De Ventis, 2.
[2] Id. ib. 51. [3] Id. ib. 37.

more unwholesome from the land. With the north wind the contrary holds good. The south wind from the sea is likewise very beneficial to fruits and plants, driving away blights and other noxious diseases.[1]

13. The south wind when gentle is not a great collecter of clouds, but it is often clear, especially if it be of short continuance. But if it lasts or becomes violent, it makes the sky cloudy and brings on rain; which comes on rather when the wind ceases or begins to die away, than when it commences or is at its height.

14. When the south wind either rises or falls, there is generally a change of weather, from fair to cloudy, or from hot to cold, and vice versâ. But the north wind often both rises and falls, without any change in the weather.

15. After frosts and long snows the south is almost the only wind which blows,[2] as if the frozen matter had been digested and so thawed. And yet it is not always followed by rain, but the same thing occurs likewise in fair thaws.

16. The south wind rises oftener and blows stronger by night than by day, especially in winter nights. The north wind, if it should rise by night (which is unusual), hardly ever lasts beyond three days.[3]

17. The south wind raises greater waves than the north, even though it blow with equal or less force.

18. In a south wind the sea appears more blue and clear; in a north wind blacker and darker.[4]

19. A sudden increase of the temperature of the air sometimes denotes rain; and again a sudden change to cold sometimes forebodes the same thing. But this de-

[1] Aristot. Problem. § De Ventis, 19.
[2] Id. ib. 3.
[3] Id. ib. 9. 15.
[4] Id. ib. 39.

pends upon the nature of the winds; for if it turn warmer with a south or east wind rain is at hand; and so likewise if it become colder with a north or west wind.

20. The south wind generally blows solitary and unresisted; but the north winds, especially Cæcias and Corus, are often accompanied by other different and contrary winds, which repel them and make them tumultuous.

21. Take care not to sow in a north wind, or to graft and inoculate when the wind is in the south.[1]

22. The leaves of trees fall sooner on the south side; but vine shoots burst out on that side, and have scarce any other aspect.[2]

23. Pliny observes that in large pastures shepherds should take care to drive their flocks to the north side, that they may feed opposite to the south. For if they feed opposite the north, they get foot-rot, scouring, and blear eyes.[3] The north wind likewise impairs their generative powers, so that if they look against the north wind as they copulate, they mostly produce ewe-lambs. But in this Pliny (as being a transcriber) is not consistent.[4]

24. Winds are injurious to the corn crops at three seasons; namely, on the opening of the flower, on the shedding of the flower, and near the time of ripening. At the two former times they either bind the flower in the stalk or shake it off; at the latter they empty the ear and scatter the grain.[5]

25. In a south wind the breath of men is more offensive, the appetite of animals is more depressed, pestilential diseases are more frequent, catarrhs common, and men are more dull and heavy; whereas in a north

[1] Pliny, xviii. c. 33, 34. [2] Pliny, xviii. 33. [3] Pliny, ubi suprà.
[4] Cf. Pliny, viii. 72. [5] Pliny, xviii. 17.

wind they are brisker, healthier, and have a better appetite.[1] The north wind however is bad for consumption, cough, the gout, or any sharp humour.

26. The east wind is dry, biting, and destructive; the west damp, mild, and genial.

27. The east wind towards the end of spring is destructive to fruits, by bringing in worms and caterpillars which devour almost all the leaves; and it is likewise unfavourable to corn. The west wind on the contrary is very favourable and friendly to plants, flowers, and all vegetation. About the autumnal equinox however the east wind also is tolerably pleasant.

28. The west winds are more violent than the east, and do more bend and wrench trees.

29. Wet weather with an east wind continues longer than with a west, and generally lasts a whole day.

30. The east and north winds when they have once begun are more continuous; the south and west winds are more variable.

31. In an east wind all visible things appear larger;[2] in a west wind all sounds are more audible and travel farther.

32. "That the wind Cæcias attracts clouds,"[3] passed into a proverb among the Greeks; in comparing it to usurers who draw in money by putting it out. It is a strong wind, but so wide spreading that it cannot drive away the clouds as quickly as they return and resist it. And this appears likewise in the larger conflagrations which make head against the winds.

33. The Cardinal or even the Semi-cardinal winds are not so stormy as the Median.

[1] Aristot. Problem. § De Ventis, 18. 44, 45. [2] Id. ib. 55.
[3] Id. ib. 1. and 32.; Cf. Erasm. Adag., i. 5. 62.

34. The Median winds from east to north-east are calmer; from north-east to east they are more stormy. So likewise the winds from east to south-east are calmer than from south-east to south; and similarly from south to south-west they are calmer than from south-west to west; and from west to north-west they are calmer than from north-west to north. So that proceeding in the order of the heavens the Median winds of the first Semi-cardinal are disposed to be calm, those of the latter to be stormy.

35. Thunder, lightning, and tornadoes, occur with cold northerly winds, as the winds Corus, Thrascias, Circias, Meses, Cæcias; whence thunder is often accompanied with hail.

36. Snowy winds likewise come from the north, but from those Median winds which are not stormy, as Corus and Meses.

37. Winds in general obtain their natures and properties in five different ways; namely, from the absence or presence of the sun; from an agreement or disagreement with the natural motion of the air; from the difference of the matter of the nurseries from which they are generated, as sea, snow, marshes, and the like; from the impregnation of the countries through which they pass; or from their local origins, whether on high, under the earth, or in the middle region; all which will be better explained in the ensuing articles.

38. All winds have a power of drying, even more than the sun itself. For the sun draws forth vapours, but does not disperse them, unless it be very powerful; whereas the wind both draws them out and carries them off.[1] But the south wind does this much less

[1] Aristot. Problem. § De Ventis, 31.

than the others; and stones and beams will sweat even more with a slight south wind than in a calm.

39. March winds are far more drying than summer winds; so that musical instrument makers will wait for March winds to dry the material of their instruments, and make it porous and musical.

40. All winds clear the air and free it from corruption, so that those are the healthiest years in which there is most wind.

41. The sun has a fortune like to that of kings, whose governors in distant provinces have more submission and obedience from their subjects than is paid to the prince himself. For winds, which derive their power and origin from the sun, have certainly equal if not more influence on the temperatures of countries and the dispositions of the air, than the sun itself. And hence it is that Peru (which from lying near the sea and having vast rivers and immense snow-mountains is copiously supplied with winds and breezes) may vie with Europe in the mild and temperate nature of the air.[1]

42. We should not be surprised at the winds having so great a force, since strong winds are like inundations and torrents and vast waves of the air. Not however that they have any very extraordinary power after all, if the matter be better examined. They may blow down trees whose tops being spread like sails help them with the pressure of their own weight. They may likewise overturn edifices that are weakly built, but the more solid structures they cannot destroy, unless accompanied by earthquakes. Sometimes they hurl down avalanches from the mountains, so as almost

[1] Acosta, Hist. des Indes, ii. 9.

to bury the plains below them; a thing which befel Solyman in the plains of Sultania.[1] Sometimes again they cause great inundations of water.

43. Winds sometimes dry up rivers, and disclose their beds. For if after a long drought there is a strong wind down stream which continues for some days, so that the fresh water is as it were swept off into the sea, and the tide is prevented from coming up, the river becomes dry in many unusual places.

Admonitions. 1. If you change the poles, you must also change your observations as to north and south. For the absence or presence of the sun is the cause, and this varies according to the position of the poles. But this may always be regarded as certain; namely, that there is more sea to the south and more land to the north, which likewise has no slight influence upon the winds.

2. Winds are generated in a thousand ways, as will be made evident in the ensuing inquiry; whence it is no easy matter to fix observations on so variable a subject. Those however which are here laid down may generally be held for certain.

The Local Origins of Winds.

With reference to the 8th Article of Inquiry. Transition. The knowledge of the local origins of the winds is a difficult inquiry; for whence the wind cometh and whither it goeth is regarded even in Scripture as a mystery. And I am not now speaking of the sources of particular winds (of which hereafter), but of the places in which winds in general are bred. Some seek for them on high, others

[1] Knolles' History of the Turks (1603).

search the deep, but they scarce look for them in that middle space where they are mostly generated. And in this they follow the manner of men to overlook what lies before their feet, and to prefer things dark and obscure. This indeed is certain, that winds are either natives or strangers; for they are as it were traders in vapours, which they collect into clouds for importation or exportation to and from different countries, receiving winds in return by way of exchange. But let us now inquire concerning native winds; for those which are strangers in one place are natives in another. Winds therefore have three local origins; that is, they either breathe and spring forth from the earth, or they are driven down from above, or they are stirred up here in the body of the air. Those driven down from above are generated in two ways; for they are either driven down before they are formed into clouds, or afterwards when the clouds have been rarified and dispersed. Let us now observe what is their history.

1. The poets have feigned that the kingdom of Æolus was situated in subterranean dens and caverns, where the winds were imprisoned, and whence they were occasionally let loose.[1]

2. Some theologians also, who were likewise philosophers, have drawn a similar inference from the words of Scripture, "Who brings forth the winds out of his treasures;" as if the winds proceeded from some subterranean treasure-houses or magazines. But there is nothing in this; for Scripture speaks likewise of the treasures of snow and rain, which no one doubts are generated above.

3. There is doubtless a large quantity of air con-

[1] Virg. Æn. i. 50., &c.

tained in the earth, which probably exhales by degrees, and must certainly from particular causes sometimes rush out in a body.

An indirect Phenomenon.

In great droughts and in the middle of summer, when the earth is more full of cracks, great bodies of water are observed to burst forth in dry and sandy places. And if water (which is a gross body) does this seldom; air (which is a thin and rarified body) will probably do it oftener.

4. When air exhales from the earth gradually and at different spots, it is at first hardly perceptible; but when many of these small emanations of air are collected together, a wind is formed from them, as a river from many springs. But this seems to be true; for the ancients have remarked that many winds at their rise and in the places whence they rise are weak at first, but gather strength as they proceed, like rivers.[1]

5. There are some places in the sea, and likewise some lakes, which without any winds swell exceedingly. This would appear to be owing to some subterraneous blast.

6. It requires a great force of subterraneous air to shake or cleave the earth, but a less to raise the water. Hence it is that earthquakes are uncommon, but swellings and risings of the waters are more frequent.

7. It is likewise everywhere observed that waters somewhat rise and swell before storms.

8. The thin subterraneous air which escapes at different spots is not perceived on land till it is collected into wind, by reason of the porous nature of the earth. But when it rises from below the waters it is perceived

[1] Cf. Gilbert, Physiol. iv. 2.

immediately from a certain swelling of the waters, by reason of their continuity.

9. It has been before observed that hollow and cavernous districts have their attendant winds; so that these would certainly appear to have their local origins from the earth.

10. On large rocky mountains the winds are found to blow both sooner (that is, before they are perceptible in the vallies), and more frequently (that is when there is a calm in the vallies); but all mountains and rocks are cavernous.

11. Gilbert observes that in Derbyshire[1] in England, a mountainous and rocky district, there are such strong eruptions of winds from some caverns, that articles of dress or rags thrown into them are blown back again with great violence, and carried up a great height into the air.

12. At Aber Barry on the Severn in Wales, there is a rocky cliff filled with holes, to which if a man apply his ear he will hear various sounds and murmurs of subterranean blasts.

Indirect Phenomenon.

Acosta has observed with respect to the towns of Plata and Potosi in Peru, which do not lie far apart from one another, and are both situated on high and mountainous ground, so that there is no difference in this point; that nevertheless the temperature of Potosi is cold and wintry, while that of Plata is mild and spring-like.[2] This may perhaps be owing to the silver mines near

[1] The Latin has Denbigh; but the true reading is preserved in Gilbert: Derbiæ.

[2] Acosta, Hist. des Indes, ii. 13.

Potosi; which proves that there are vents for hot and cold blasts from the earth.

13. If the earth be the original source of cold, as Parmenides maintained (an opinion not to be despised, seeing that cold and density are closely united);[1] it is not less probable that warm exhalations should be thrown up from the central cold of the earth, than that they should be thrown down from the cold of the upper air.

14. It is said by some of the ancients that there are certain wells in Dalmatia and the country of Cyrene, into which if a stone be thrown, storms will soon arise;[2] as if the stone broke through some covering in a place where the winds were confined.

Indirect Phenomenon. Ætna and many other mountains vomit forth flames; and it is probable that air may break out in the same way, especially being expanded and set in motion by subterranean heat.

15. Upon earthquakes, certain foreign and noxious winds are observed to blow, both before and after the shock; just as a light smoke is commonly emitted before and after great conflagrations.

Admonition. Air confined in the earth is forced out by many causes. Sometimes a badly cemented mass of earth falls into a hollow; sometimes the waters ingulf themselves in the earth; sometimes the air is expanded by subterranean fires and requires greater space; sometimes the earth, which was before firm and vaulted, is reduced to ashes by internal fire, and being no longer able to support itself falls in. And there are many other similar causes.

[1] Arist. Metaph. i. 5. [2] Pliny, ii. 44.

So much then for the inquiry concerning the first local origin of the winds, namely, from under the earth. I come now to the second origin; namely, from on high, or from what is called the middle region of the air.

Admonition. Let no one misinterpret my words into a denial that the other winds may likewise be generated from vapours both of land and sea. But this I have mentioned is the first kind of winds which spring from the earth as winds ready formed.

16. It has been observed that woods begin to rustle before winds are manifestly perceived;[1] whence it is conjectured that wind descends from above. This is likewise remarked on mountains (as I have mentioned before), but the cause is less certain by reason of the hollows therein.

17. The shooting and twinkling of stars foretels wind from that quarter where the shooting is seen;[2] which shows that the air is disturbed above, before the motion reaches us.

18. The clearing of the sky and dispersing of the clouds foreshadow winds, before they are felt on the earth; which likewise prove that winds commence above.

19. Before the rising of a wind, the lesser stars are not visible, even on a clear night;[3] the air apparently being condensed, and made less transparent by the matter which is afterwards turned into winds.

20. Halos round the moon, a blood-red sunset, a red moon on her fourth rising, and many other prog-

[1] Pliny, xviii. 86.
[2] Arist. Prob. xxvi. 25.; and Cf. Pliny, xviii. 80.
[3] Pliny, ubi suprà.

nostics of winds derived from above (whereof I will treat in their proper place), indicate that the matter of winds is there commenced and prepared.

21. In these phenomena you may remark the difference already mentioned between the two ways whereby winds are generated above; namely, before and after the collection of vapours into cloud. For the prognostics from halos and the colours of the sun and moon have some cloudy matter; but the shooting and obscuration of the smaller stars take place in a clear sky.

22. When wind proceeds from a formed cloud, the cloud is either totally dissipated and turned into wind; or it is divided partly into rain, and partly into wind; or it is rent asunder, and the wind bursts forth as in a storm.

23. Many indirect phenomena may be observed in nature of the repercussion by cold. Wherefore, since the cold in the middle region of the air is plainly very intense, it is evident that vapours cannot for the most part penetrate those regions, but must be either congealed or hurled back again. And this was the opinion of the ancients, which in this instance is sound.

The third local origin of winds is in the case of those which are generated in the lower air; to which likewise I give the name of swellings or overcharges of the air. It is a thing very common and familiar, but yet hitherto passed over in silence.

Speculation. The generation of those winds which are stirred in the lower air is nothing more mysterious than this. The air newly created from water and rarified and resolved vapours, being united to the

former air, can no longer be confined within the same limits as before, but swells and rolls onwards and occupies a larger space. But here we must assume two things. First, that a drop of water turned into air (whatever stories they may tell of the decimal proportion of the elements) requires at least a hundred times more space than before; and secondly, that a little new air in motion, when superadded to the old, stirs and puts the whole in motion. And this may be seen by the draught from a pair of bellows or a crack in the window, which will set the air of the whole room in motion, as the flame of the candles will directly show.

24. As dews and mists are generated in the lower air, without being turned into clouds or penetrating into the middle region; so it is with many of the winds.

25. There is a continual breeze playing on seas and waters, which is only a slight wind newly generated.

26. The rainbow, which is the lowest of the meteors and generated nearest the earth, when it does not appear entire, but broken and only with the ends visible, is resolved into winds, as much if not more than into rain.

27. It has been observed that in countries which are divided and separated by the interposition of mountains some winds that are common on one side of the range do not reach the other.[1] This manifestly shows that they are generated below the tops of those mountains.

28. There is an infinite variety of winds, which blow in clear weather, and even in countries where

[1] Gilbert, Phys. iv. 1.

it never rains, that are generated where they blow, without ever having been clouds or reaching to the middle region of the air.

Indirect Phenomena.

Any one who knows how easily vapour is resolved into air, how great is the quantity of vapours, and how much greater space drop of water occupies when turned into air than it did before (as has been mentioned above), and how little compression the air bears, will feel certain that winds must be generated everywhere, from the surface of the earth to the highest parts of the atmosphere. For a large quantity of vapour, when it begins to expand, cannot possibly rise to the middle region of the air without surcharging the air and producing disturbance on the way.

Accidental Generations of Winds.

With reference to the 9th Article of Inquiry. Transition.

Accidental generations of winds are those which do not produce or create an impulsive motion, but either excite it by compression, or drive it back by repercussion, or roll and agitate it by curves. And this is effected by external causes, and the position of contiguous bodies.

1. There is more agitation of the air and sensation of winds in places where there are low hills surrounded by vallies with a higher range of hills beyond, than either on mountains or plains.

2. Winds and draughts are felt in towns where there is any wide place with narrow outlets or passages, and at the corners of streets.

3. Ventilation is produced or arises naturally in

houses, where there is a thorough draught, the air going in at one side and out at the other. But it is done more effectually, if the air enters from different sides, meets in angles, and has a common outlet at the meeting-place. Arched and circular dining rooms are cooler likewise, because the air which is stirred in them is reflected in all directions. Curved porticoes are better than straight ones; for a wind in a straight line, though it is not confined but has a free outlet, yet does not make the air so unequal, voluminous, and undulatory, as the meeting in angles, the windings about and collections in a round space, and the like.

4. After great storms at sea the accidental wind lasts for a time after the original wind has settled. And this is caused by the collision and percussion of the air from the undulation of the waves.

5. In gardens the wind is commonly found to be repelled by walls, buildings, and mounds; so that one would think it blew in a contrary direction to that in which it really blows.

6. If one side of a country is surrounded by hills, and a wind blow for a long time from the plain to the hills, this wind being repelled by the hills is either condensed into rain, if it be a moist wind, or changed into a contrary wind, which however is of no long continuance.

7. In weathering headlands sailors often experience a change of wind.

Extraordinary Winds and Sudden Gusts.

With reference to the 10th Article of Inquiry.

Some writers give opinions and reasons touching extraordinary winds, as hurricanes or storms, whirlwinds, typhoons, and siroc-

Transition. cos; but they give no description of the thing itself, which certainly is to be sought from journals and scattered history.

1. Sudden gusts never come in a clear sky, but only when it is cloudy and with rain; so that there is rightly thought to be an eruption, with a discharge of the wind and a concussion of the water.

2. Those storms attended with cloud and fog, called "belluæ," which rise up like pillars, are very violent and dangerous at sea.

3. The greater typhoons, which extend over some considerable space and carry things up into the air along with them, seldom occur; but the lesser and as it were playful eddies and whirlwinds are common.

4. All storms, typhoons, and greater whirlwinds, have a manifest motion of precipitation or vibration downwards, more than the other winds. And hence they appear to rush like torrents, and to flow down as in channels, and to be then repelled by the earth.

5. It sometimes happens that in meadows haycocks are carried up into the air, and then spread abroad like a cover over the field. Again, bundles of pea-straw, sheafs of corn, and linen hung out to dry, are lifted as high as the tops of trees or above the tops of houses by whirlwinds; and all this is done without any great force or violence of wind.

6. Sometimes these very slight and partial whirlwinds take place even on a clear day; so that a person riding may see dust or straws caught up and whirled round near him without feeling much wind. This is doubtless caused by contrary breezes mutually repelling one another, and making a circulation of air by the concussion.

7. It is certain that there are some blasts which leave behind them on plants manifest traces of burning and scorching. But the sirocco, which is an invisible lightning and a burning air without flame, is referred to the inquiry on lightning.

Things Contributing to Winds, that is, the Original; for of Accidental Winds it has been inquired above.

With reference to the 11th, 12th, 13th, 14th, and 15th Articles of Inquiry. Transition.

The ancients have given a very confused and uncertain account of the winds and their causes, and mostly not true. But no wonder that those who do not look close do not see clearly. They talk as if wind were something else, different from air in motion; and as if exhalations generated and composed the whole body of winds; and as if the matter of winds were only a hot and dry exhalation;[1] and as if the origin of the motion of winds were only an expulsion and repercussion from the cold of the middle region; all which things are mere arbitrary and imaginary suppositions. But yet from these threads, which are indeed but cobwebs, they weave large webs. Whereas in reality every impulse of the air is a wind; exhalations mixed with the air contribute more to the motion, than to the matter of the winds; moist vapours are by a well proportioned heat turned into wind more easily than dry exhalations; and many winds, besides those which are driven down and repelled from above, are generated in the lower region of the air, and exhale from the earth. Let us observe what is the language of the things themselves.

1. I have mentioned in the article on general winds,

[1] Arist. Meteorolog. ii. 4.

that the natural rotation of the air, without any other external cause, generates a perceptible wind within the tropics, where the air revolves in larger circles.

2. Next to the natural motion of the air, before inquiring concerning the sun, which is the principal parent of the winds, we must observe whether anything be due to the moon and other stars, upon clear experimental evidence.

3. Great and violent winds arise some hours before an eclipse of the moon; so that if the moon is eclipsed at midnight, there are winds the evening before; but if in the morning, there are winds at midnight.

4. Acosta observes that in Peru, which is a very windy country, there is most wind at the full moon.[1]

Injunction. It would be well worth observing, what effect the motions and changes of the moon have upon the winds, for they certainly influence the waters. For instance, whether the winds like the tides are not somewhat higher at the full and new moon, than in the quarters. For though it may be a convenient theory, that the moon has dominion over the waters, and the sun and stars over the air; yet it is certain that water and air are very homogeneous bodies, and that next to the sun, the moon has the greatest power in every thing here below.

5. Greater winds are observed to blow about the time of the conjunctions of planets.

6. Winds and stormy weather are frequent at the rising of Orion;[2] but we should observe whether this does not proceed from the rising of that constellation at a time of year most generative of winds; so that it

[1] Hist. des Indes, ii. 7. [2] Arist. Problem. De Ventis, 14.

would be rather a concomitant than a cause. And a similar doubt might justly be raised respecting the rains at the rising of the Hyades and Pleiades, or the storms at the rising of Arcturus. And so much with regard to the moon and stars.

7. The sun doubtless is the primary efficient of many winds, as by its heat it operates upon two kinds of matter; namely, the body of the air, and vapours or exhalations.

8. The sun, when powerful, expands air, though pure and entirely unmixed, perhaps as much as one-third, which is no trifling difference. From this simple expansion therefore some wind must arise in the sun's paths, especially during great heats; and that rather two or three hours after sunrise than at daybreak.

9. In Europe, the nights are more sultry; in Peru, the three first hours of the morning;[1] both from the same cause, namely, the cessation of winds and breezes at those hours.

10. In a water thermometer dilated air depresses the water as with a blast; but in a glass filled only with air and capped with a bladder the dilatation of the air blows out the bladder perceptibly, like a wind.

11. I made an experiment of this kind of wind in a round tower that was completely shut up on every side. A chafing dish of coals thoroughly ignited so that there might be no smoke was placed in the middle of the room. At one side of this, but at some distance from it, I suspended a thread, with a cross of feathers fastened to it to make it more susceptible of motion. After a short time therefore, when the heat had increased and the air dilated, the cross of feathers

[1] Acosta, Hist. des Indes, ii. 13.

with its thread began to wave about, first to one side and then to the other. And further, when a hole was made in the window of the tower, a warm gust of air passed out, not continuous, but intermittent, and in undulating currents.

12. The contraction of the air by cold after it has been dilated likewise creates a wind of the same kind, but weaker, because cold has less force. In Peru therefore under any spot of shade not only is the coolness greater than is felt here (which is the result of *antiperistasis*), but there is a manifest breeze from the contraction of the air as soon as it comes under the shade.[1] And so much for wind caused by mere dilatation and contraction of the air.

13. Winds rising from mere motions of the air, with no intermixture of vapours, are soft and gentle. Let us now inquire concerning vaporous winds (or winds generated from vapours), which may be as much stronger than the former, as the expansion of a drop of water turned into air exceeds any expansion of air already made; which it was shown to do many degrees.

14. The sun with its proportionate heat is the efficient of vaporous winds (which are those that commonly blow). The matter is the vapours and exhalations turned and resolved into air; I say air (not anything other than air), though not quite pure to begin with.

15. The sun when it has little heat raises no vapours, and therefore creates no wind.

16. The sun, when it has a moderate heat, draws out vapours, but does not immediately dissipate them. And therefore, if there be a large quantity of them,

[1] Acosta, ubi supra.

they collect into rain, either alone, or accompanied with wind. If the quantity be small, they are turned into wind alone.

17. The heat of the sun on its increase is more disposed to generate winds; on its decrease to generate rain.

18. The intense and continued heat of the sun rarifies, disperses, and elevates vapours, and at the same time mixes them equally and incorporates them with the air; which makes the air calm and serene.

19. The equal and continuous heat of the sun is less favourable than the unequal and variable heat for the generation of winds. Hence it is that winds are less troublesome in a voyage to Russia than in the English Channel, by reason of the long days. But at the time of the equinox in Peru, winds are very frequent, by reason of the great inequality of heat between day and night.

20. In vapours both the quantity and quality are of importance. A small quantity produces gentle gales; a moderate quantity strong winds; a large quantity charges the air and generates rain, either with or without winds.

21. Vapours arising from the sea, rivers, and inundations, generate a far greater quantity of winds than do exhalations from the land. But yet winds which arise from the earth, and less damp places, are more fixed and continuous; and these generally are those which are driven down from above. The opinion therefore of the ancients would not have been totally unprofitable in this respect, had they not chosen as it were to divide the inheritance, and to assign rains to the vapours and only exhalations to the winds. And

things of this kind sound well in words, but are really worthless and unprofitable.[1]

22. Winds from the melting of snow on the mountains occupy a middle space between water and land winds, but incline rather to the former, though they are more keen and active.

23. The melting of snow on the snow mountains always, as has been before observed, produces periodical winds from that quarter.

24. The anniversary north winds at the rising of the dog-star[2] are supposed to come from the frozen sea, and the regions about the Arctic circle, where the ice and snow are not melted till summer is far advanced.

25. The masses or mountains of ice which are carried down towards Canada and Newfoundland are more generative of cold gales than variable winds.

26. The winds from sandy or chalky soils are few and dry; but in hotter countries the same are sultry, smoky, and burning.

27. Winds generated from sea-vapours more easily return to rain, as the watery element asserts and reclaims its right; but if this does not take place, they mix directly with the air, and remain quiet. But terrestrial, smoky, and unctuous exhalations are less easily resolved, ascend higher, are more excited in their motion, frequently penetrate into the middle region of the air, and make up some of the matter of fiery meteors.

28. It is reported in England that, when Gascony was under our dominion, the inhabitants of Bordeaux and the neighbourhood presented a petition to the king, to stop the burning of heather in Sussex and Hamp-

[1] Arist. Meteorolog. ii. 4. [2] Cf. Pliny, ii.

shire; because about the end of April it caused a wind destructive to the vines.

29. The meetings of winds together, if the winds be strong, produce violent whirlwinds; but if the winds be gentle and moist, they cause rain and a calm.

30. Winds are calmed and restrained in five ways; namely, when the air charged and agitated with vapours is freed by the vapours becoming condensed into rain; or when the vapours are rarified and dissipated, and are thus mixed with the air, and agree well with it, and keep quiet; or when vapours or exhalations are raised and exalted so high, that there is a complete freedom from them, till they are either driven down from the middle region of the air, or admitted into it; or when vapours collected into clouds are driven by the upper winds into other countries, and so leave the lands over which they pass calm and undisturbed; or lastly, when the winds blowing from their nurseries become feeble by reason of the length of their journey and the want of fresh matter, and losing their force gradually die out.

31. Showers generally allay the winds, especially if they be stormy; as on the other hand winds often keep off rain.

32. Winds contract themselves into rain (which is the first and principal of the five ways in which they are calmed), either when overcharged by the quantity of vapours, or by reason of the contrary motions of gentle winds, or by reason of the opposition of mountains and headlands, which resist the shock of the winds and gradually turn them back on themselves, or by reason of the condensation from intense cold.

33. The smaller and lighter winds generally rise in

the morning and fall at sunset, as the condensation of the night air has power enough to contract them. For the air will submit to some compression without becoming agitated.

34. The sound of bells is supposed to dissipate thunder and lightning; but this has not come under observation with respect to winds.

Admonition. Consult here the passage concerning the prognostics of winds; for there is some connection between causes and signs.

35. Pliny mentions that the violence of a whirlwind is stopped by pouring vinegar upon it.[1]

The Limits of Winds.

With reference to the 16th, 17th, and 18th Articles of Inquiry.

1. It is said that the priests who offered the yearly sacrifices on the altars at the tops of Mont Athos and Olympus used to find the letters which they had traced in the ashes of the victims the preceding year no way disarranged or obliterated; and this, although the altars did not stand in a temple, but in the open air.[2] This fully proved that at that elevation there had been neither rain nor wind.

2. It is said that at the top of the Peak of Teneriffe, and also on the Andes between Peru and Chili, snow lies along the cliffs and sides of the mountains; but at the summits themselves there is nothing except a still air, so rarified as almost to stop respiration, and so acrimonious and pungent as to excite nausea in the stomach, and to redden and inflame the eyes.[3]

3. Vaporous winds do not appear to blow at any

[1] Pliny, ii. 49.

[2] Cf. Arist. Prob. xxvi. 39.; and Solinus Polyhist. 15.

[3] Cf. Acosta. iii. 9. 20.; and Purchas, v. 785.

great elevation, though some of them are probably higher than most clouds.

So much for the height; now for the latitude of the winds.

4. The winds certainly occupy very various spaces; sometimes very extensive, and sometimes very narrow and confined. They have been known to cover a space of 100 miles within a few hours.

5. Free winds that range over a wide space are generally strong and not mild. They last generally for about twenty-four hours, and are not rainy. Confined winds on the other hand are either mild or stormy, but always of short duration.

6. Periodical winds are itinerant, and fill a very extensive space.

7. Stormy winds do not travel far, though they always spread beyond the limits of the storm itself.

8. Sea winds are much more partial than land winds; so that sometimes at sea a fresh breeze may be observed to be curling and ruffling the water in one direction, while everywhere else the sea is as calm and smooth as a mirror.

9. I have before alluded to the small whirlwinds which sometimes play before persons on horseback, almost like the blast from a pair of bellows.

I now pass from the latitude to the duration of the winds.

10. Very strong winds continue longest at sea, where there is a plentiful supply of vapours. On land they scarce ever last more than a day and a half.

11. Very gentle winds do not blow continuously for more than three days, either on land or sea.

12. The east wind, as has been elsewhere observed,

is of longer duration than the west. And also every wind which springs up in the morning is more lasting than one that rises in the evening.

13. It is certain that winds (unless they are mere storms) rise and increase gradually, but fall more quickly, and sometimes all at once.

The Successions of Winds.

With reference to the 19th, 20th, and 21st Articles of Inquiry.

1. If the wind follows the motion of the sun, that is if it move from east to south, from south to west, from west to north, from north to east, it does not generally go back; or if it does, it is only for a short time. But if it move contrary to the motion of the sun, that is if it changes from east to north, from north to west, from west to south, from south to east, it generally returns to the former quarter, at least before it has completed the entire circle.

2. If rain falls before the wind commences, the wind will last longer than the rain. But if the wind blows first and is afterwards laid by rain, it does not often rise again; and if it does, it is followed by fresh rain.

3. If the wind shifts about for a few hours as if it was trying the different points, and then commences to blow constantly from one quarter, that wind will last many days.

4. If a south wind begin to blow for two or three days, a north wind will sometimes rise directly afterwards. But if there has been a north wind for as many days, the wind will blow for a short time from the east before it comes from the south.[1]

5. Towards the end of the year and the commence-

[1] Arist. Prob. xxvi. 49.

ment of winter, if the south wind blow first and be succeeded by the north, it will be a severe winter.[1] But if the north wind blow at the commencement of winter, and be succeeded by the south, the winter will be mild and warm.

6. Pliny quoting Eudoxus asserts that the same series of winds returns every four years;[2] which does not appear to be true, for the revolutions are not so rapid. It has been observed by the diligence of some that the greater and more remarkable seasons of weather, as great heats, great snows, great frosts, warm winters, and cold summers, generally come round in a circuit of thirty-five years.

The Motions of Winds.

With reference to the 22nd, 23rd, 24th, 25th, 26th, and 27th Articles of Inquiry.

Transition.

Men talk as if the wind were a body of itself, which of its own force drove and impelled the air before it. And likewise when it changes, they talk as if the same wind transferred itself to another place. And when the people talk in this way, philosophers prescribe no remedy for such opinions, but they themselves talk confusedly, without opposing these errors.

1. After the inquiry therefore into the local origins of the winds, I come next to that concerning the raising and directing of their motion. In winds which have the commencement of motion in their first impulse, as those which are driven from above, or exhale from the earth, the excitation of motion is manifest. The former descend, the latter ascend at their commencements, and afterwards acquire a winding motion

[1] Arist. Prob. xxvi. 48.

[2] Pliny, ii. 48.

from the resistance of the air, principally according to the angles of their force. But the inquiry concerning the winds which are stirred up everywhere in the lower air, (and are the commonest winds of all,) is more obscure. And yet, as has been observed in the speculation on the eighth article, the thing itself is common and familiar.

2. There is some resemblance to this thing in that experiment of the close tower which has been described before. For that experiment was varied in three ways. The first was that already mentioned, by means of a chafing dish of ignited and bright coals. The second was by removing the chafing dish, and substituting a kettle of boiling water, which made the motion of the cross of feathers slower and less active than before; as the heat was not strong enough to prevent the dewy vapour of the water from hanging in the air, and could not dissipate it into the matter of wind. The third was by the use of both the chafing dish and the kettle, which most of all agitated the cross of feathers; so that it appeared sometimes to be lifted up as by a small whirlwind. For now there was both the water to supply plenty of vapour, and the chafing dish at hand to dissipate it.

3. From this it appears that the overcharging the air by the resolution of vapour into air is a principal cause of exciting motion in the winds.

I must now pass on to the direction of motion, and its verticity or change of direction.

4. The direction of the progressive motion of the winds is controlled by the nurseries, which are to winds what fountains are to rivers. Such are places which abound in vapours; for there is the native country of

the winds. Now when they have found a current, where the air offers no resistance, (as water finds a declivity,) they unite with all the homogeneous matter they find in their course, and carry it off with them, as rivers do. Winds therefore always blow from the quarter where their nurseries lie.

5. When the winds have no special nurseries in any fixed spot, they become exceedingly erratic and easily change their current; as may be seen in the middle of the sea and in wide plains.

6. When the winds have great nurseries in one spot, but receive small accessions from the places through which they journey, they blow strongly at first, but gradually slacken. On the other hand when the nurseries are more continuous, the winds are gentler at first, but afterwards increase.

7. The winds have movable nurseries in the clouds, which are often transported by the upper winds to places far distant from the nurseries of the vapours from which those clouds were generated. But in this case there begins to be a nursery of the wind on that side where the clouds are first turned into wind.

8. The verticity of the winds is not caused by a wind transporting itself while it is blowing, but by its either falling of itself, or being overpowered by another wind. And all this depends on the different situations of the nurseries of winds, and the different times and seasons when the vapours emanating from these nurseries are resolved.

9. If there be nurseries of winds on opposite sides, that is, if one be in the north, the other in the south, the stronger wind will prevail, and will blow continuously without any contrary winds, but somewhat dead-

ened and subdued by the weaker one; in the same way as the force of the tide is affected by the stream of a river; for the motion of the sea does prevail, and becomes the only motion, yet it is somewhat checked by the course of the river. But if the stronger of these two contrary winds happens to fall, the wind will at once spring up from the opposite quarter whence it before blew, though it had been made imperceptible by the power of the stronger.

10. For instance, if there be a nursery of wind in the north-east, the north-east wind will blow. But if there be two nurseries, one to the east, the other to the north, the winds will blow separate for some distance up to the point of confluence; and then they will set in from the north-east, or with an inclination in the direction of the stronger.

11. If the stronger nursery of wind be to the north, twenty miles distant from any country, and the weaker one be to the east only ten miles off, the east wind will blow for some hours; but soon afterwards the north wind will arrive and supersede it.

12. If the north wind be blowing and fall in with a mountain on the west side, it will soon change to north-east; that is, to a compound of the original and reflected wind.

13. If there be a land nursery of winds to the north, and the blast from it go straight up, and meet with a cold cloud from the west which drives it to the opposite point, it will blow from the north-east.

Admonition. The nurseries of the winds on sea and land are stationary, so that their birthplace and origin may be better discovered. But the nurseries in the clouds are movable, so that the matter of winds is

supplied in one place, while they are formed elsewhere. And this accounts for the direction of motion in the winds being more variable and confused.

These are adduced by way of example; but the like holds in like cases. And so much for the direction of the motion of winds. But we must see further respecting the longitude and as it were the voyage of winds, though this may seem to have been inquired into a little before under the title of latitude. For if winds occupy greater spaces latitudinally than longitudinally, their breadth may be mistaken for their length.

14. If it be true that Columbus on the coast of Portugal inferred the existence of a continent in America from the periodical westerly winds, winds would certainly appear to travel a very long way.

15. If it be true that the melting of the snows about the Arctic Sea and Scandinavia causes north winds to blow in Italy and Greece during the dog days, that certainly is a great distance.

16. The comparative rapidity with which weather travels in the direction of the different winds has not as yet been observed; for instance, how much quicker a storm comes up from the east with an easterly wind; how much slower from the west.

And so much for the progressive motion of winds; we must now look to their undulation.

17. The undulation of winds is a momentary action; for even a strong wind will rise and fall alternately at least a hundred times in an hour; which shows how unequal the force of the winds is. For neither rivers, though rapid, nor currents at sea, though strong, have any undulation at all, except when the wind blows. And this undulation of the winds has no equality in

it, but is like the pulse, sometimes double and sometimes intermittent.

18. The undulation of the air differs from that of the water in this; in water the waves rise, but fall again spontaneously to a level; so that (notwithstanding the lofty expressions of the poets concerning storms, "that the waves rise to heaven and sink to hell,") they do not fall much below the level surface of the water. But in the undulation of the air, where there is no motion of gravity, the air is raised and depressed almost equally. And so much for undulation. We must now inquire concerning the motion of conflict.

19. I have already partly inquired into the conflicts and compound currents of the winds. It is manifest that winds, especially the milder ones, are ubiquitous; as is likewise proved by the fact that there are few days or hours wherein some gentle breezes do not blow in open places; and that with great irregularity and variety. For the winds which do not proceed from the larger nurseries are erratic and changeable; sometimes propelling and sometimes flying from one another, as if in sport.

20. Two contrary winds are sometimes observed to meet together at sea; as is shown by the ruffling of the surface of the water on both sides, and the stillness between them. After the collision, if the winds break each other equally, a general calm ensues; but if the stronger wind prevail, the agitation of the water is continued.

21. It is certain that in Peru winds often blow from one quarter on the mountains, and directly contrary in the vallies.

22. It is likewise certain that with us the clouds move in a direction contrary to the wind here below.

23. Again, the higher clouds are sometimes seen to scud over the lower; so as to pass in different and even contrary directions, as if driven by opposite currents.

24. It is likewise certain that in the upper air the winds sometimes are neither distracted nor impelled, while half a mile below they are driven along in mad fury.

25. Contrariwise also, there is sometimes a calm below when the clouds are moving rapidly above; but this is less common.

Indirect phenomenon.

In the waves likewise, sometimes the water on the top, sometimes that below moves the quickest; and sometimes (though rarely) there are different currents of water, the one above and the other below.

26. We should not altogether neglect the testimony of Virgil, seeing he was by no means ignorant of natural philosophy; "At once the winds rush forth, the east, and south, and south-west laden with storms;"[1] and again, "I have seen all the battles of the winds meet together in the air."[2] So far then have I inquired concerning the motions of the winds in nature. I must now look to their motion in machines of human invention; and above all in the sails of ships.

The Motion of Winds in the Sails of Ships.

1. The largest British ships (for I take them as my

[1] Una Eurusque Notusque ruunt, creberque procellis Africus. — *Æn.* i. 85.

[2] Omnia ventorum concurrere prælia vidi. — *Georg.* i. 318.

example) have four and sometimes five masts; all standing erect one behind the other in a straight line drawn through the centre of the vessel.

2. The names of these masts are; the mainmast in the centre, the foremast, the mizenmast (which is sometimes double), and the bowsprit.

3. Each mast consists of several parts, two or three in number, which may be raised, and by certain knots or joints fixed in their place, and in like manner taken down.

4. The bowsprit from its lower fastening is inclined towards the sea, from its upper fastening it is erect. All the other masts are perpendicular.

5. These masts are rigged with ten sails, and when the mizenmast is double, with twelve. The mainmast and the foremast have three tiers of sails, which we call the mainsail, the topsail, and the top-gallantsail. The others have only two sails, being without the top-gallantsail.

6. The sails are extended crossways, near the top of each joint of the mast, by pieces of timber which we call yards. To these the upper part of the sail is stitched, while the lower part is tied with ropes at the corners only; and in this fashion the mainsail is attached to the sides of the ship, the topsail and the top-gallantsail to the yards contiguous to them. The same ropes serve to draw or turn them to either side at pleasure.

7. The yard of each mast stretches in a horizontal direction; except that of the mizenmast, which is slanted, with one end elevated and the other depressed. The rest are at right angles to the mast, like the cross of the letter T.

8. The mainsails of the mainmast, foremast and bowsprit, are of a quadrangular or parallelogram shape; and the top and top-gallantsails are somewhat sharpened and pointed; but in the mizenmast the topsail is pointed and the mainsail triangular.

9. In a ship of 1100 tons, 112 feet long in the keel, and 40 feet wide in the hold, the mainsail of the mainmast was 42 feet deep and 87 feet wide.

10. The topsail of the same mast was 50 feet deep, 84 feet wide at the base, and 42 at the top.

11. The top-gallantsail was 27 feet deep, 42 feet wide at the base, and 21 at the top.

12. The mainsail of the foremast was 40½ feet deep, and 72 feet wide.

13. The topsail was 46½ feet deep, 69 feet wide at the base, and 36 at the top.

14. The top-gallantsail was 24 feet deep, 36 feet wide at the base, and 18 at the top.

15. The mainsail of the mizenmast was, from the upper point of the yard-arm, 51 feet deep, its width where it is joined to the yard-arm was 72 feet, the other part ending in a point.

16. The topsail was 30 feet deep, 57 feet wide at the base, and 30 at the top.

17. If there are two mizenmasts, the sails of the hindmost are about one fifth less than those of the foremost.

18. The mainsail of the bowsprit was 28½ feet deep, and 60 feet in width.

19. The topsail was 25½ feet deep, 60 feet wide at the base, and 30 at the top.

20. The proportions of sails and masts vary not only according to the size of the ship, but also according to

the various purposes for which they are built, as whether for war, traffic, speed, and the like. But the dimension of the sails is no way proportioned to the tonnage of the vessel; for a vessel of 500 tons or thereabouts will carry the mainsail of its mainmast only a few square feet less than that other which was twice the size. And hence it is that small vessels sail much faster than large ones, not only by reason of their lightness, but by reason of the size of their sails in comparison with the body of the ship; for if this proportion were kept in large vessels the sails would be too large and unmanageable.

21. As every sail is stretched out straight at the top, and only fastened by the corners at the bottom, they must necessarily be all swollen out by the wind; especially towards the bottom where they are slackest.

22. The swell is much greater in the mainsails than in the rest; not only because they are of a parallelogram shape, and the others pointed; but also because the width of the yard-arm so far exceeds the width of the sides of the vessel, to which they are fastened. For this makes them so slack as to present a great hold to the wind; so that in the large vessel here chosen as a model, the swell of the sail inwards in sailing before the wind may be as much as nine or ten feet.

23. From the same cause likewise all sails swollen by the wind become arched at the bottom, so that much of the wind must necessarily miss them. In the above mentioned vessel this arch is almost equal to the stature of a man.

24. The swell in the triangular sail of the mizenmast is necessarily less than in a quadrangular sail;

both because it is of a less capacious shape, and because in a quadrangular figure three sides are slack, in a triangular one only two; whence it is more stiff for the reception of the wind.

25. The nearer the wind's motion approaches to the head of the ship, the more powerful and propellent it becomes; because it comes at a place where the waves are most easily divided, by reason of the sharpness of the bow, but principally because the motion at the head of the vessel draws the ship along, the motion at the stern only pushes her.

26. Ships are better propelled by the motion of the wind in the upper than in the lower tiers of sails; because violent motion is most powerful when furthest removed from the resistance; as is shown in levers and the sails of windmills. But it endangers the sinking or upsetting of the ship, and therefore these sails are sharpened at the point, that they may not catch too much wind; and they are principally used when there is little wind.

27. When the sails are placed in a straight line, one behind the other, if the wind blow straight from behind, the hindmost must needs steal all the wind from those before them; so that if all the sails were spread at once, the force of the wind would be almost entirely spent on the sails of the mainmast, with little help from the mainsail of the bowsprit.

28. In a ship sailing straight before the wind, the best and most commodious disposition of the sails is to hoist the two lower sails of the foremast (for there the motion has been stated to be most powerful), and also the topsail of the mainmast. For there will be space enough left below to allow the wind to fill the afore-

mentioned sails of the foremast, without any considerable loss.

29. In consequence of this stealing of the wind by one sail from another, a ship will sail faster with a side wind than with a direct one. For with a side wind all the sails may be crowded; because they all turn their sides to one another, without one standing in the way of the other, or stealing the wind from it.

30. With a side wind likewise the sails are stretched tighter against the wind, which somewhat compresses it, and impels it to that part where it ought to blow; whereby it receives some additional strength. The most favourable wind however is that which blows half way between a fore wind and a side one.

31. The mainsail of the bowsprit can scarcely ever be useless; for, as it collects all the wind that blows everywhere round the sides of the ship and beneath the other sails, it does not suffer from being robbed.

32. In the motion of winds in ships, both impulse and direction are regarded. But direction by the rudder does not much belong to the present inquiry, except so far as it is connected with the motion of winds in the sails.

Transition. As the motion of impulse is greatest at the head, so the motion of direction is greatest at the stern. And therefore the mainsail of the mizenmast contributes most thereto, and supplies an auxiliary power to the rudder.

33. The mariner's compass being divided into thirty-two points, and each semicircle containing sixteen, a vessel may sail straight forward (without tacking, as is

usual when the winds are directly contrary), even though of these sixteen points ten are opposite, and only six favourable; but this navigation greatly depends on the mainsail of the mizenmast. For the points of the wind which are contrary to the ship's course, being the stronger and beyond the control of the helm alone, would turn the other sails together with the ship itself into the contrary direction; did not this sail, being tightly stretched, act the other way, and by favouring and strengthening the motion of the helm, turn and bring round the head of the vessel to its right course.

34. All wind in the sails somewhat weighs down and sinks the ship; and this the more, as the wind comes more from above. And this is the reason why in heavy storms they first lower the yards, and furl the topsails; and then, if it is necessary they take down all the rest, cut down the masts themselves, and throw overboard their cargo, guns, &c., to lighten the ship, that she may float and follow the motion of the waves.

35. With a fresh and favourable breeze, a merchant vessel may sail 120 Italian miles in twenty-four hours, by means of this motion of the winds; and some packet boats called caravels, built entirely for speed, will accomplish a still greater distance. When the winds are directly contrary, they have this last but feeble resource to make some way; which is, they proceed sideways, according as the wind will permit, out of their course, and then by an angular movement they bear up again into it; and continuing this mode of progression (which is slower than that of the serpent, for serpents make folds, whereas they make angles), they will perhaps contrive to make 15 miles in twenty-four hours.

Major Observations.

1. The motion of winds in the sails of vessels has three principal heads and fountains of impulse, from whence it springs. From these likewise we may derive rules for increasing and strengthening it.

2. The first source is from the quantity of wind received. For no one doubts that much wind contributes more than little; and therefore a quantity of wind must be carefully procured. This we shall do, if like prudent stewards we are economical and guard against robbery. Therefore, as far as possible, take care that no wind is lost, wasted, or stolen.

3. The wind blows either above the ship's sides, or below them as far as the level of the sea. And as provident men are very careful even about the smallest matters (for there is no one who does not care for the larger ones); so we must first observe these lower winds, though indisputably they are less powerful than the higher ones.

4. With regard to the winds that play chiefly about the sides and under the sails of ships, it is clearly the business of the mainsail of the bowsprit, which is bent low and slanting, to catch them, and so prevent any loss or waste of wind. And this is both a help in itself, and yet it does not hinder the winds which supply the other sails. On this point I do not see how human industry can improve; unless perhaps the same kind of low sails were to be used as feathers or wings from the centre of the ship; two on each side, when the wind blows straight from behind.

5. With regard to the prevention of robbery of the foresails by the backsails, in sailing straight before the

wind (for with a side wind all sails co-operate), I do not see what human care can do; unless it be to make a kind of ladder of sails; in which the sails of the mizenmast should hang lowest, those of the mainmast next, and those of the foremast highest. For in this way one sail would not hinder but rather assist another, by passing on and transmitting the wind. Let these observations then suffice for the first fountain of impulse.

6. The second fountain of impulse springs from the manner in which the wind strikes the sail. For if by reason of the contraction of the wind the blow be sharp and quick, the motion will be greater; but if it be dull and feeble, the motion will be less.

7. And in relation to this, it is of very great importance that the sails should only have a moderate swell and extension. For if they be stretched tight, they act like a wall to repel the wind; if they be slack, they make the impulse feeble.

8. With regard to this, in some things human industry has acquitted itself well, though rather by accident than by judgment. For in a side wind they draw in as much as possible the part of the sail opposite to the wind; and thereby they drive the wind to that part where it ought to blow. This indeed they do intentionally. But another effect (which perhaps they do not see) is, that the wind is more contracted and makes the impulse sharper.

9. I do not see what human industry can add to this part; unless it be to alter the shape of the sails, and make some of them to swell, not spherically but in the shape of a spur or triangle with a yard or pole in the vertical angle; so that the wind may be contracted

more to a point and the external air may be cut more powerfully. And this angle in my opinion ought not to be acute, but like a triangle with the vertex cut off to make it wide. Nor do I know what advantage there might be in having a sail within a sail; that is, in inserting in the middle of a large sail a kind of purse, not altogether slack of simple canvass, but with ribs of wood, so as to catch the wind in the middle of the sail and draw it to a point.

10. The third fountain of impulse depends on the place where the percussion is made, and is of two kinds. For the impulse is stronger and easier at the fore part of the vessel than at the hinder; and from the upper part of the masts and sails than from the lower.

11. Neither has this escaped the industry of man; for both in sailing before the wind they put the greatest stress on the sails of the foremast, and in calms they do not neglect to spread their top-gallantsails. Nor can I think at present of any further improvement open to human industry in this point; unless it be, in the first case, to put in two or three foremasts, (the centre one upright, the others inclined) with sails hanging forward; and in the second case to broaden the top-gallantsails of the foremast, and make them less pointed than usual. But in both cases there should be great care not to sink the ship too much.

The Motion of Winds in other Machines of Human Invention.

1. There is nothing very intricate in the motion of windmills, but yet it is not generally well demonstrated or explained. The sails stand right opposite the wind that is blowing; one side however turning more to the

wind, and the other gradually inclining and receding from it. The turning or revolving motion always commences on the lower side, that is, the one furthest from the wind. The wind rushing against the machine is compressed by the four sails, and compelled to make a passage through the four openings between them. But this confinement it does not willingly submit to; so that it begins as it were to jog the sides of the sails and turn them round, as children's toys are set in motion and turned by the finger.

2. If the sails were stretched out equally, it would be uncertain which side they would incline, as it is a question which way a stick would fall. As however the side which meets the wind throws off the force of the wind to the lower side, and thence through the vacant intervals; and as the lower side, like the palm of the hand or the sail of a ship, receives the wind, the rotation forthwith commences from that part. But it should be observed that the origin of motion is not from the first impulse which is made in front, but from the lateral impulse, after compression has taken place.

3. I have made several trials and experiments for increasing this motion, both as a token that the cause has been well discovered, and for present use; contriving imitations of the motion by means of paper sails and the wind from a pair of bellows. Accordingly, to the lower side of the sail I fastened an additional fold, turned away from the wind, that the wind being now directed from the side might have a larger surface to strike against. But this did no good; for the extra fold did not so much assist the percussion of the wind, as it impeded the cutting of the air by the sails. At some distance behind the sails, and the whole breadth

of their diameter, I placed obstacles, that the wind being more compressed might strike with greater force; but this did more harm than good, as the repercussion deadened the primary motion. Again I made the sails double their former width, to compress the wind more, and make the lateral percussion stronger. This at last was completely successful, for the sails were turned with a much gentler blast, and revolved much faster.

Injunctions. 1. This increase of motion will perhaps be produced more conveniently by eight sails, than by four sails of double breadth; unless by chance the weight should be so great as to impede the motion. But of this make a trial.

2. The length of the sails likewise contributes to motion. For in rotations a little force toward the circumference is equal to a far greater force towards the centre. But to this there is one drawback: namely, that the longer the sails are, the further are they separated at the top, and the less is the wind compressed. It might perhaps answer to make the sails a little longer, but widening at the top like the blade of an oar. But of this I have made no experiment.

Admonition. If these experiments be put in practice in windmills, the whole machine, especially its foundations, should be strengthened. For the more the wind is compressed (though it increase the motion of the sails), yet the more does it shake the whole machine.

4. It is said that in some parts of the world there are chariots moved by the wind. Let this be carefully inquired.

Injunction. Chariots moved by the wind cannot an-

swer, except in open places and plains. Besides, what is to be done if the wind drops? It would be more reasonable to facilitate the motion of waggons and carriages by movable sails which might spare the strength of horses or oxen, than to depend upon the wind alone for creating motion.

Prognostics of Winds.

With reference to the 32nd Article of Inquiry. Transition.

The purer part of Divination should be the more received and practised, in proportion as it is wont in general to be corrupted by vanity and superstition. Natural Divination is sometimes more certain, sometimes more treacherous, according to the nature of the subject with which it deals. For if the subject be of a constant and regular nature, the prediction is certain; if it be of a variable nature, and compounded as it were of nature and chance, the prediction is uncertain. But yet even in a variable subject, if rules are diligently framed, a prediction will generally hold good, and will not err much from the truth, though it does not hit the exact point of time. Again, some predictions will be certain enough as to the time of fulfilment; namely, such as are taken not from causes, but from the thing itself having already commenced but displaying itself sooner in a favourable and well disposed matter, than in another; as I have mentioned before, in the topics with reference to this thirty-second article. I will now therefore propound the prognostics of winds, introducing along with them some prognostics of rain and fair weather, which could not well be separated from them; though the full inquiry thereof I remit to their own proper titles.

1. If the sun appear concave at its rising, the day

will be windy or showery; windy, if the sun be only slightly concave, and showery, if the concavity is deep.

2. The sun pale and (as we call it) watery at its rising denotes rain; if it set pale, wind.

3. If the body of the sun appear blood-red at setting, it forebodes high winds for many days.

4. If the rays of the sun on rising are not yellow, but ruddy, it denotes rain rather than wind. The same likewise holds good of the setting.

5. If either on rising or setting the sun's rays appear shortened or contracted, and do not shine out bright, though there are no clouds, it denotes rain rather than wind.

6. If rays precede the sunrise, it is a sign both of wind and rain.

7. If at sunrise the sun emits rays from the clouds, the middle of his disk being concealed therein, it indicates rain, especially if these rays break out downwards, so as to make the sun appear bearded. But if rays strike from the centre, or from different parts of the sun, whilst the outer circle of his disk is covered with clouds, there will be great storms both of wind and rain.

8. If there be a circle round the sun at rising, expect wind from the quarter where the circle first begins to break; but if the whole circle disperses evenly, there will be fine weather.

9. A white ring round the sun towards sunset portends a slight gale that same night; but if the ring be dark or tawny, there will be a high wind the next day.

10. Red clouds at sunrise foretel wind; at sunset, a fine day for the morrow.

11. Clouds collected near the sun at sunrise forebode

a rough storm that same day; but if they are driven from the east and pass away to the west, it will be fine.

12. If at sunrise the clouds about the sun disperse, some to the north and some to the south, though the sky round the sun itself is clear, it portends wind.

13. The sun setting behind a cloud forebodes rain the next day; but actual rain at sunset is rather a sign of wind. If the clouds appear as if they were drawn towards the sun, it denotes both wind and rain.

14. If at sunrise the clouds do not appear to surround the sun, but to press upon him from above as if they were going to eclipse him, a wind will arise from the quarter on which the clouds incline. If this take place at noon, the wind will be accompanied by rain.

15. If clouds shall have shut in the sun, the less light there is left and the smaller the sun's orb appears, the more severe will the storm prove. But if the disk of the sun appear double or treble, as if there were two or three suns, the storm will be much more violent, and will last many days.

16. The dispositions of the air are shown by the new moon, though still more on the fourth rising, as if her newness were then confirmed. But the full moon itself is a better prognostic than any of the days which succeed it.

17. From long observation, sailors suspect storms on the fifth day of the moon.

18. If the new moon is not visible before the fourth day, the air will be unsettled for the whole month.

19. If at her birth, or within the first few days, the lower horn of the moon appear obscure, dark, or any way discoloured, there will be foul and stormy weather

before the full. If she be discoloured in the middle, it will be stormy about the full; but if the upper horn is thus affected, about the wane.

20. If, on her fourth day, the moon is clear, with her horns sharp, not lying entirely flat, nor standing quite upright, but something between the two, there is a promise mostly of fair weather till the next new moon.

21. If on that day she rises red, it portends wind; if reddish or dark coloured, rain; but neither of these portend anything beyond the full.

22. An erect moon is almost always threatening and unfavourable, but principally denotes wind. If however she appear with blunt and shortened horns, it is rather a sign of rain.

23. If one horn of the moon is sharp and pointed, the other being more blunt, it rather indicates wind; but if both are so, it denotes rain.

24. A circle or halo round the moon signifies rain rather than wind; unless the moon stands erect within the ring, when both are portended.

25. Circles round the moon always foretel wind from the side where they break; and a remarkable brilliancy in any part of the circle denotes wind from that quarter.

26. Double or treble circles round the moon foreshadow rough and severe storms; and much more so, if these circles are not pure and entire, but spotted and broken.

27. Full moons, with regard to colours and halos, have perhaps the same prognostics as the fourth risings; but the fulfilment is more immediate and not so long deferred.

28. The weather is generally clearer at the full than

at the other ages of the moon; but in winter the frost then is sometimes more intense.

29. The moon appearing larger at sunset, and not dim but luminous, portends fair weather for several days.

30. Eclipses of the moon are generally attended by wind; eclipses of the sun by fair weather; but neither of them are often accompanied by rain.

31. Wind must be expected both before and after the conjunctions of all the other planets with one another, except the sun; but fair weather from their conjunctions with the sun.

32. Rains and showers follow upon the rising of the Pleiades and Hyades, but without wind; storms upon the rising of Orion and Arcturus.

33. Shooting stars, as they are termed, foretel immediate winds from the quarter whence they shot. But if they shoot from different or contrary quarters, there will be great storms both of wind and rain.

34. When small stars, like those called Aselli, are not visible in any part of the sky, there will be great storms and rains within a few days; but if these stars are only obscured in places, and are bright elsewhere, they denote winds only; but sooner.

35. A uniform brightness in the sky at the new moon or the fourth rising presages fair weather for many days. If the sky is uniformly overcast, it denotes rain; if irregularly overcast, wind from the quarter where it is overcast. But if it suddenly becomes overcast without cloud or fog, so as to dull the brightness of the stars, rough and serious storms are imminent.

36. An entire circle round any planet or larger star

forebodes rain; if the circle be broken, there will be wind from the quarter where it breaks.

37. When the thunder is more continuous than the lightning, there will be great winds; but if it lightens frequently between the thunder-claps, there will be heavy showers with large drops.

38. Thunder in the morning denotes winds; at noon, showers.

39. Rolling thunder, which seems to be passing on, foretels wind; but sharp and interrupted cracks denote storms both of wind and rain.

40. Lightning in a clear sky signifies the approach of wind and rain from the quarter where it lightens; but if it lightens in different parts of the sky, there will be severe and dreadful storms.

41. If the lightning is in the colder quarters of the heaven, as the north and north-east, hailstorms will follow; but if in the warmer, as the south and west, there will be showers, with a sultry temperature.

42. Great heats after the summer solstice generally end in thunderstorms; but if these do not come, in wind and rain, which last for many days.

43. The ball of fire, called *Castor* by the ancients, that appears at sea, if it be single, prognosticates a severe storm (seeing it is Castor the dead brother), which will be much more severe if the ball does not adhere to the mast, but rolls or dances about. But if there are two of them (that is, if Pollux the living brother be present), and that too when the storm has increased, it is reckoned a good sign. But if there are three of them (that is, if Helen, the general scourge, arrive), the storm will become more fearful. The fact seems to be, that one by itself seems to indicate that the tem-

pestuous matter is crude; two, that it is prepared and ripened; three or more, that so great a quantity is collected as can hardly be dispersed.[1]

44. If the clouds appear to drive fast when there is no wind, expect wind from that quarter from which they are driven. But if they gather and collect together, on the sun's approach to that part, they will begin to disperse; and then if they disperse towards the north it prognosticates wind, if towards the south, rain.

45. Black or dark clouds arising at sunset prognosticate rain; on the same night, if they rise in the east opposite the sun; if close to the sun in the west, the next day, accompanied with wind.

46. If the sky clears and the clouds commence to break in the quarter opposite the wind, it will be fine; but if it clear up to windward, it indicates nothing, and leaves the weather uncertain.

47. Sometimes the clouds appear to be piled in several tiers or stories, one above the other (Gilbert declares[2] that he has sometimes seen and observed five together), whereof the lowest are always the blackest; though it sometimes appears otherwise, as the whiter most attract the sight. Two stories, if thick, portend instant rain (especially if the lower one appear overcharged); many tiers denote a three days' rain.

48. Fleecy clouds, scattered over the sky, denote storms; but clouds which rest upon one another like scales or tiles portend dry and fine weather.

49. Feathery clouds, like palm branches or the fleur-de-lis, denote immediate or coming showers.

50. When mountains and hills appear capped by

[1] Pliny, ii. 37. [2] Gilbert, Phys. iv. 1.

clouds that hang about and embrace them, storms are imminent.

51. Clouds before sunset of an amber or gold colour, and with gilt fringes after the sun has sunk lower, foretel fine weather.

52. Clay-coloured and muddy clouds portend rain and wind.

53. If a little cloud suddenly appear in a clear sky, especially if it come from the west, or somewhere in the south, there is a storm brewing.

54. If mists and fogs ascend and return upwards, they denote rain; and if this take place suddenly, so that they appear to be sucked up, they foretel winds; but if they fall and rest in the vallies, it will be fine weather.

55. A white loaded cloud, called by the ancients *a white tempest*, is followed in summer by showers of very small hail; in winter, by snow.

56. A calm autumn portends a windy winter; a windy winter a wet spring; a wet spring a serene summer; a serene summer a windy autumn; so that the year, according to the proverb, is seldom its own debtor, and the seasons are never the same two years together.

57. Fires burning paler than usual, and murmuring within, are significant of storms. If the flame shoot in a twisting and curling form, it principally denotes wind; but fungous growths or excrescences on the wicks of lamps rather foreshadow rain.

58. Coals, when they burn very bright, foretel wind; and likewise when they quickly cast off and deposit their ashes.

59. When the surface of the sea in harbour appears

calm, and yet there is a murmuring noise within it, although there is no swell, a wind is coming.

60. The shores sounding in a calm, and the sea itself beating with a moaning or echo louder and clearer than usual, are signs of wind.

61. If foam, white circles of froth, or bubbles of water, appear here and there on a calm and smooth sea, they prognosticate wind. If these signs be more striking, they denote severe storms.

62. Glittering foam (called sea-lungs) in a heavy sea foretels that the storm will last for many days.

63. The sea swelling silently and rising higher than usual in the harbour, or the tide coming in quicker than ordinary, prognosticates wind.

64. A sound from the mountains, an increasing murmur in the woods, and likewise a kind of crashing noise in the plains, portend winds. An extraordinary noise in the sky, when there is no thunder, is principally due to winds.

65. Leaves and straws playing in the air when no breeze is felt, the down of plants flying about, and feathers floating and playing on the water, show that winds are at hand.

66. Water-fowl meeting and flocking together, but especially sea-gulls and coots flying rapidly to shore from the sea or lakes, particularly if they scream, and playing on the dry land, foreshow wind; and this is more certain if they do it in the morning.

67. On the other hand, land birds, especially crows, when they go to the water, beat it with their wings, throw it over them and scream, foreshow storms.

68. Divers and ducks prune their feathers before a wind; but geese seem to call down the rain with their importunate cackling.

69. A heron, when it soars high so as sometimes to fly above a low cloud, shows wind; but kites flying high show fair weather.

70. Ravens, when they croak continuously, denote wind; but if the croaking is interrupted or stifled, or at longer intervals, they show rain.

71. The whooping of an owl was thought by the ancients to betoken a change of weather, from fair to wet, or from wet to fair. But with us an owl, when it whoops clearly and freely, generally shows fair weather, especially in winter.

72. If birds that dwell in trees return eagerly to their nests, and leave their feeding ground early, it is a sign of storms; but when a heron stands melancholy on the sand, or a raven stalks about, it only denotes rain.

73. Dolphins sporting in a calm sea are thought to prognosticate wind from that quarter whence they come; but if they play in a rough sea, and throw the water about, it will be fine. Most other kinds of fish, when they swim at the top of the water, or sometimes leap out of it, foretel rain.

74. Swine are so terrified and disturbed and discomposed when the wind is getting up, that countrymen say, that this animal alone sees the wind, and that it must be frightful to look at.

75. Spiders work hard and spin their webs a little before wind, as if desiring to anticipate it; for they cannot spin when the wind begins to blow.

76. The ringing of bells is heard at a greater distance before rain; but before wind it is heard more unequally, the sound coming and going, as we hear it when the wind is blowing perceptibly.

77. Pliny mentions it as a fact, that trefoil bristles and erects its leaves against a storm.[1]

78. He likewise asserts, that vessels containing eatables sometimes leave a sweat behind them in the storerooms; and that this is a sign of fearful storms.

Admonition. Since rain and winds are made of nearly the same matter, and since, by reason of the reception of the new-made air into the old, some condensation of the air always takes place before wind, as is shown by the moaning of the shores, the high flight of the heron, and other things; and since the air is in like manner condensed before rain (though when the rain falls it is afterwards more contracted, when the wind rises on the contrary it is more expanded), it must needs be that rains and winds have many common prognostics. With reference to these consult the Prognostics of Rains under their own title.

Imitations of Winds.

With reference to the 33rd Article of Inquiry.

Transition. If men could only bring themselves not to fix their thoughts too intently on the consideration of the subject before them, rejecting everything else as irrelevant, and not to refine with endless and mostly unprofitable speculations thereon, they would never be so dull as they are wont to be, but by a free passage and transference of their thoughts they would find many things at a distance which near at hand are concealed. And therefore, in the law of nature, as well as in the civil law, we must proceed with sagacity of mind to look for like and analogous cases.

[1] Pliny, xi.

1. Bellows are with men as the bags of Æolus, whence a man may draw wind, according to the proportion of man. The passes and interstices of mountains, and the winding passages of buildings, are likewise nothing else than large bellows. Bellows are principally used for rousing a flame, or blowing the organ. The principle is, that they suck in the air to prevent a vacuum (as the saying is), and drive it out by compression.

2. Hand-fans are likewise used to make a wind and to produce coolness by gently impelling the air.

3. I have already made some observations on cooling rooms in summer, in my reply to the 9th article of inquiry. But other and more perfect methods may be devised, especially by drawing the air in at one part, and discharging it at another, after the manner of bellows. The present methods only relate to simple compression.

4. Winds in the bodies of men and animals excellently correspond to the winds of the greater world. For they are both generated from moisture and alternate with it, as winds and rains do; they are likewise dissipated and made to perspire by a strong heat. And hence we may transfer this observation to the winds; namely, that they are produced from a matter which yields a tenacious vapour, that is not easily resolved; as beans, pulse, and fruit. And this holds good also in the greater winds.

5. In distilling vitriol and other fossils of a flatulent nature, very large and capacious receivers are required; as otherwise they would be broken.

6. The wind made by the nitre mixed in gunpowder, that explodes and inflates the flame, not only imi-

tates but exceeds all other winds, except those derstorms.

7. The force of this wind is compressed in made by man, as guns, mines, and powder r when they blow up. But whether a great qu gunpowder fired in the open air would likewi commotion of the air raise a wind that woul many hours, has not yet been tried.

8. Quicksilver contains a flatulent and spirit, so that (as some maintain) it resemb powder, and a little of it mixed with gu makes the powder stronger. Chemists also gold, in certain proparations of it, makes c explosions, almost like thunder. But of the I have no experience.

A Major Observation.

The motion of winds is in most respects se motions of water, as in a mirror.[1]

Great winds are inundations of the air, th blance of which we see in inundations of the both arising from an increase of quantity.

Waters either descend from above or spr the earth; and so some winds are driven fro some rise from below.

Sometimes there are contrary motions in r tide flowing one way, the stream of the river t and yet there is only one motion, because th of the tide prevails. And so, when contra blow, the greater subdues the less.

In currents of the sea and of some rivers, times happens that the stream at the top of

[1] Cf. Aristot. Problems, xxvi. 38., and Meteorol. i.

moves in a contrary direction to that below. And so in the air, when contrary winds blow together, one flies above the other.

There are cataracts of rain confined in a narrow space; so are there whirlwinds.

Waters, if disturbed, have an undulating besides a progressive motion; at one time rising into ridges, at another descending into furrows. And this likewise happens to the winds, except that they have not the motion of gravity.

There are also other resemblances, which may be observed from the things already inquired.

Provisional Rules respecting the Winds.

Transitions. Rules are either particular or general; but here both kinds are provisional. For as yet I do not pronounce certainly upon anything. Particular rules may be drawn or expressed from almost every article; certain general ones, but only a few, I shall myself select, and subjoin.

1. Wind is merely air in motion: nothing besides: air put in motion either by simple impulsion, or by the mixture of vapours.

2. Winds arising from the simple impulsion of the air are produced in four ways; namely, by the natural motion of the air, by the expansion of the air in the path of the sun, by the contraction of the air from sudden cold, or by the compression of the air from external bodies.

There may also be a fifth way; namely, by the agitation and concussion of the air from the stars; but let matters of this kind be passed in silence

for the present, or only listened to with suspicion.

3. The principal cause of winds produced by the mixture of vapours is the overcharging of the air by the air newly created from vapours; for thereby the bulk of the air is increased and requires more room.

4. A small increase in the quantity of air causes a great swell in every part of the atmosphere; so that this new air from the resolution of vapours contributes more to the motion than to the matter; but the great body of wind is composed of the former air. Nor does the new air drive the old air before it, as if they were separate bodies; but both being mixed together require greater room.

5. Any other concurrent principle of motion, besides the surcharge of the air, acts as an accessory to strengthen and increase the chief one. And this is the reason why high stormy winds seldom rise from the simple surcharge of the air.

6. There are four accessories to the surcharge of the air; namely, exhalation from below, precipitation from what is called the middle region of the air, dispersion from the formation of a cloud, and mobility and acrimony of the exhalation itself.

7. The motion of the wind is almost always lateral. That created by the simple surcharge of the air is so from the very first; that caused by exhalations from the earth or repercussion from above becomes so soon after; unless the eruption, precipitation, or recoil, are extremely violent.

8. The air will submit to some compression before it is conscious of being overcharged, and before it impels the air contiguous to it. This will account for

all winds being somewhat more condensed than air at rest.

9. Winds are allayed in five ways; namely, by the meeting, incorporation, elevation, transportation, or deficiency of vapours.

10. The gathering of vapours, and in fact of the air itself into rain, is caused in four ways; namely, by the excess of quantity, or the condensation by cold, or the compulsion of contrary winds, or the repercussion from obstacles.

11. Both vapours and exhalations are the matter of winds. Rain is never generated from exhalations, but winds most frequently proceed from vapours. There is however this difference; that winds generated from vapours more easily incorporate themselves with the pure air, are sooner calmed, and are not so stubborn as those arising from exhalations.

12. The modification and different conditions of heat have as much to do with the generation of winds, as have the quantity or conditions of matter.

13. The sun's heat, in the generation of winds, should have just power enough to raise them; neither so abundant as to collect them into rain, nor so scanty as entirely to scatter and disperse them.

14. Winds blow from the direction of their nurseries. When however these nurseries are situated in different quarters, different winds generally blow together, till the stronger either overpowers the weaker, or turns it into its own current.

15. Winds are generated everywhere, from the surface of the earth to the cold region of the air; but the common winds are generated close at hand, the stronger winds above.

16. Countries where the attendant winds are warm are hotter, and countries where these winds are cool are colder, than in proportion to their climate.

A Map or Table of Human Requirements with reference to the Winds; or Desiderata with their Approximations.

Desideratum. 1. A better method of ordering and disposing the sails of ships, so as to make more way with less wind; a thing very useful in shortening sea voyages, and saving expense.

Approximation. No approximation has been hitherto invented which in practice should exactly correspond to this requirement. But for this consult the major observations on the 26th article.

Desideratum. 2. A method of constructing windmills with sails, so as to grind more with less wind; a thing likewise useful and lucrative.

Approximation. Consult on this point our experiments in reply to the 27th article, where the thing appears to be almost done.

Desideratum. 3. A method of foreknowing the risings, fallings, and times of winds; a thing useful in navigation and agriculture, but especially so in selecting the times for naval engagements.

Approximation. Many things have been remarked in the inquiry which bear upon this subject, but especially the reply to the 32nd article. Now however that the cause of the winds is explained, the more diligent observations of posterity (if it shall care at all about these things) will discover more certain prognostics.

Desideratum. 4. A method of prognosticating and forming an opinion upon other things by means of the

winds; for instance, whether in any part of the sea there are continents or islands, or whether the sea is open; a thing of use in new and unknown navigations.

Approximation. The observation about the periodical winds, which Columbus appears to have used, is an approximation to this.

Desideratum. 5. A method likewise of foretelling, every year, whether corn and fruit will be abundant or scarce; a thing useful and lucrative in speculative sales and purchases; of which an instance is related in the case of Thales when he bought up the olives.[1]

Approximation. Some observations under the 29th article of inquiry, on malignant or tearing winds, and the times when they are prejudicial, bear upon this point.

Desideratum. 6. A method likewise of foretelling the diseases and epidemics for every year; a thing useful to the reputation of physicians, if such things could be predicted; as also for the causes and cures of diseases, with some other matters of business.

Approximation. Some observations on the 30th article of inquiry have likewise reference to this question.

Admonition. For predictions from the winds concerning crops, fruits, and diseases, consult the Histories of Agriculture and Medicines.

Desideratum. 7. A method of raising and allaying winds.

Approximation. There are some superstitious and magical ceremonies connected with this subject, which do not appear worthy to be received into a serious and exact natural history. Nor does any approximation at present occur to me. It will however be of service thereto, to inspect and inquire thoroughly into

[1] Diog. Laert. i. 26.

the nature of the air; to see if there be anything which, on being communicated in a small quantity to the air, can excite and multiply the motion of dilatation or contraction in the body of the air. For if this could be done, the raising and calming of the winds would naturally follow; like Pliny's experiment, if it be true, of throwing vinegar against the whirlwind.[1] Another method might be, by letting out subterranean winds wherever a great quantity was collected, as is told of the well in Dalmatia. But it is difficult to discover these places of confinement.

Desideratum. 8. Methods of performing many amusing and wonderful experiments by the motion of the winds.

Approximation. Such questions I have no time to consider. The approximation is the common games which depend on the wind; and, no question, many pleasant things of this kind, both with regard to sound and motion, may be invented.

[1] Pliny, ii. 49.

INTRODUCTIONS TO THE TITLES DESIGNED FOR THE NEXT FIVE MONTHS.

FOR THE INTRODUCTION

TO

THE HISTORY OF DENSE AND RARE,

SEE THE HISTORY.

THE HISTORY OF HEAVY AND LIGHT.

INTRODUCTION.

THE motion of heavy and light was distinguished by the ancients under the name of natural motion. For they saw no external efficient, and no apparent resistance. Moreover this motion seemed to gain rapidity by its progress. To their contemplation or rather discourse on this subject they added by way of seasoning the mathematical fancy that heavy bodies would adhere to the centre of the earth (even if a hole were made through it), together with the scholastic fiction of the motion of bodies to their own places. And believing that by these positions they had settled the question, they made no further inquiry, except that there was one of them who inquired somewhat more diligently concerning the centre of gravity in different figures, and touching the things which float on water. Nor has one of the moderns contributed anything of consequence; having only added a few mechanical inventions, and even those distorted by his demonstrations. But to speak direct, it is quite certain that a body is affected only by a body; and that there is no local motion which is not excited either by the parts of the body moved, or by the adjacent bodies, or by those contiguous or proximate to it, or at least by those

which lie within the sphere of its activity. Gilbert therefore has not unscientifically introduced the question of magnetic force, but he has himself become a magnet; that is, he has ascribed too many things to that force, and built a ship out of a shell.

THE HISTORY OF THE SYMPATHY AND ANTIPATHY OF THINGS.

INTRODUCTION.

Strife and friendship in nature are the spurs of motions and the keys of works. Hence are derived the union and repulsion of bodies, the mixture and separation of parts, the deep and intimate impressions of virtues, and that which is termed the junction of actives with passives; in a word, the *magnalia naturæ*. But this part of philosophy concerning the sympathy and antipathy of things, which is also called Natural Magic, is very corrupt; and (as is almost always the case), there being too little diligence, there has been too much hope. The effect of hope on the mind of man is very like the working of some soporific drugs, which not only induce sleep, but fill it with joyous and pleasing dreams. For first it throws the human mind into a sleep by the recital of specific properties, and secret and heaven-sent virtues; whence men are no longer wakeful and eager in searching out real causes, but are content to rest in such kinds of indolence; and then it insinuates and infuses into it innumerable fancies, like so many dreams. Men likewise in their folly expect to become acquainted with nature from her outward face and mask, and by external resemblances to detect internal

properties. Their practice also is very like their inquiry. For the rules of natural magic are such, as if men expected to till the ground and eat their bread without the sweat of their brow, and by an easy and indolent application of bodies to become masters of things. And they are always talking of the magnet, and the sympathy of gold with quicksilver, and a few other things of the kind, and appealing to them as sureties to accredit other things which are not bound by any similar contract. But God has ordained that whatever is excellent shall be won only by labours both in inquiry and working. For my own part, in unravelling the law of nature, and interpreting the relations of things, I shall show somewhat more diligence, not giving way to marvels and wonders, and yet not instituting a narrow or partial inquiry.

THE HISTORY OF SULPHUR, MERCURY, AND SALT.

INTRODUCTION.

This triad of principles has been introduced by chemists, and as a speculative doctrine it is the best discovery that they have made. The deepest philosophers amongst them maintain the elements to be earth, water, air, and ether. But these they regard not as the matter of things, but as wombs, wherein specific seeds of things are generated, in the same manner as in the womb. But instead of the First Matter (which the schoolmen call matter spoiled and indifferent), they substitute these three things, sulphur, mercury, and salt; whereof all bodies are compounded and mixed. Their terms I accept, but not their opinions, which do not appear sound. It seems however not to sort ill with their opinion, that two of these, namely, sulphur and mercury (in the sense in which I take them), I judge to be the most primæval natures, the most original configurations of matter, and among the forms of the first class almost the principal. But these terms of sulphur and mercury may be varied, and receive different denominations; as, the oily, the watery, the fat, the crude, the inflammable, the non-inflammable, and the like. For they appear to be those two enormous

tribes of things which occupy and penetrate the universe. In the subterranean world we find sulphur and mercury, as they are called; in the animal and vegetable world we find oil and water; in pneumatical bodies of the lower order we find air and flame; in the celestial regions we find starry body and pure ether. But of this last pair I do not as yet pronounce decisively, though the concordance appears probable. With regard to salt, the case is different. For if by salt they mean the fixed part of a body, which does not turn either into flame or smoke, this belongs to the inquiry of matter fluid and matter determinate, whereof I am not now speaking. But if they mean salt to be taken in its plain and literal signification, it cannot be regarded as a thing different from sulphur and mercury, seeing it is a formation compounded from them both, by means of a strong spirit. For all salt has some inflammable parts; and some parts which not only do not conceive flame, but strenuously shrink from and avoid it. However, since the inquiry concerning salt has some connection with the inquiry into the other two things, and moreover is of great use,—seeing that salt comprises in itself the nature of sulphur and mercury, and is a rudiment of life itself,—I have thought good to admit it likewise into this history and inquiry. But meanwhile I give notice that I reserve the inquiries into those pneumatical bodies, air, flame, the stars, and ether, for titles of their own (as they certainly merit); and that here I only institute a history of sulphur and mercury tangible, that is, either mineral, vegetable, or animal.

FOR THE INTRODUCTION

TO

THE HISTORY OF LIFE AND DEATH,

See the HISTORY.

THE FRAGMENT OF A BACONIAN BOOK,

ENTITLED

THE ALPHABET OF NATURE.

WHEREAS so many things are produced by the earth and water, so many things pass through the air and are received by it, so many things are changed and dissolved by fire, the other inquiries would be less clear and complete, if the nature of those common masses that occur so often were not well known and explained. To these I subjoin inquiries concerning the Heavens and Meteors, seeing that they also are Greater Masses, and belonging to the Universal.

Greater Masses. Sixty-seventh Inquiry, or that concerning the Earth; denoted by τ τ τ.

Greater Masses. Sixty-eighth Inquiry, or that concerning Water; denoted by υ υ υ.

Greater Masses. Sixty-ninth Inquiry, or that concerning Air; denoted by φ φ φ.

Greater Masses. Seventieth Inquiry, or that concerning Fire; denoted by χ χ χ.

Greater Masses. Seventy-first Inquiry, or that concerning the Heavens; denoted by ψ ψ ψ.

Greater Masses. Seventy-second Inquiry, or that concerning Meteors; denoted by ω ω ω.

Conditions of Beings.

It remains to inquire in this alphabet into the conditions of Transcendental Beings, which have little concern with the body of nature, but yet in the method of inquiry which I use will give no small light to the rest. In the first place therefore since, as Democritus has well observed, the nature of things is rich and (according to him) infinite in the quantity of matter, and the variety of individuals; but so limited in combinations and species as even to appear scanty and destitute, for there are hardly enough species existing or capable of existing to make up a thousand in number; and since negatives attached to affirmatives are of great use for the information of the mind; we must institute an inquiry concerning Existence and Non-Existence, which comes seventy-third in order, and is marked by α α α α.

Conditions of Beings; or concerning Existence and Non-Existence; denoted by α α α α.

Possibility and Impossibility are nothing else than Potentiality or Non-Potentiality of Being. Let the seventy-fourth inquiry be on this subject, and be marked β β β β.

Conditions of Beings. Concerning Possibility and Impossibility; denoted by β β β β.

Much and Little, Rare and Common, are the Potentialities of Being in Quantity. Let the seventy-fifth inquiry be concerning them, and be marked by γ γ γ γ.

Conditions of Beings. Concerning Much and Little; denoted by γ γ γ γ.

Durable and Transitory, Eternal and Momentary, are Potentialities of Being in Duration. Let the seventy-sixth inquiry be concerning them, and be marked δ δ δ δ.

Conditions of Beings. Concerning Durable and Transitory; denoted by δ δ δ δ.

Natural and Unnatural are Potenialities of Being, according to the course of nature, or according to deviations from it. Let the seventy-seventh inquiry, marked ϵ ϵ ϵ ϵ, be concerning them.

Conditions of Beings. Concerning Natural and Unnatural; denoted by ϵ ϵ ϵ ϵ.

Natural and Artificial are Potentialities of Being, without or by means of human assistance. Let the seventy-eighth inquiry, marked ζ ζ ζ ζ, be concerning them.

Conditions of Beings. Concerning Natural and Artificial; denoted by ζ ζ ζ ζ.

Examples in explanation of the order of the alphabet are not adjoined, because the inquiries themselves contain whole hosts of examples.

The titles by which the order of the alphabet is arranged should by no means have such authority as to be received for true and fixed divisions of things. For this would be to profess that we know the things which we inquire; since no one can divide things truly who has not a full knowledge of their nature. Let it be enough if the titles are convenient for the course of inquiry, which is our present business.

THE RULE OF THE ALPHABET.

The alphabet is constructed and directed in this manner. The history and experiments occupy the first place. These, if they represent an enumeration and series of particular things, are set down in tables; otherwise they are taken separately.

But since history and experiments are very often deficient, especially those light-giving and crucial instances which serve to satisfy the understanding as to the true causes of things; some injunctions are given touching new experiments, which form a kind of Designed History. For what other course is open to us who are just entering on the path?

In the case of any more subtle experiment, the method which I have employed is explained; for there may be a mistake, and it may stimulate others to devise better and more exact methods.

Admonitions and cautions are likewise interspersed respecting the fallacies of things, and the errors which are of frequent occurrence in discovery. I attach also my own observations on the history and experiments, that the interpretation of nature may be in the more forwardness.

Rules and Imperfect Axioms, such as occur to me in the course of inquiry (for I do not pronounce upon anything), I set down and prescribe, but only provisionally. For they are useful if not altogether true.

Lastly, I sometimes make attempts at interpretation, though of a very humble nature, and no way worthy in my estimation to be honoured with that name. For what need have I of pride or imposture, seeing that I so often declare that we are not furnished with so much

history and experiments as we want, and that without these the interpretation of nature cannot be accomplished; and that therefore it is enough for me if I do my part in setting the thing on foot?

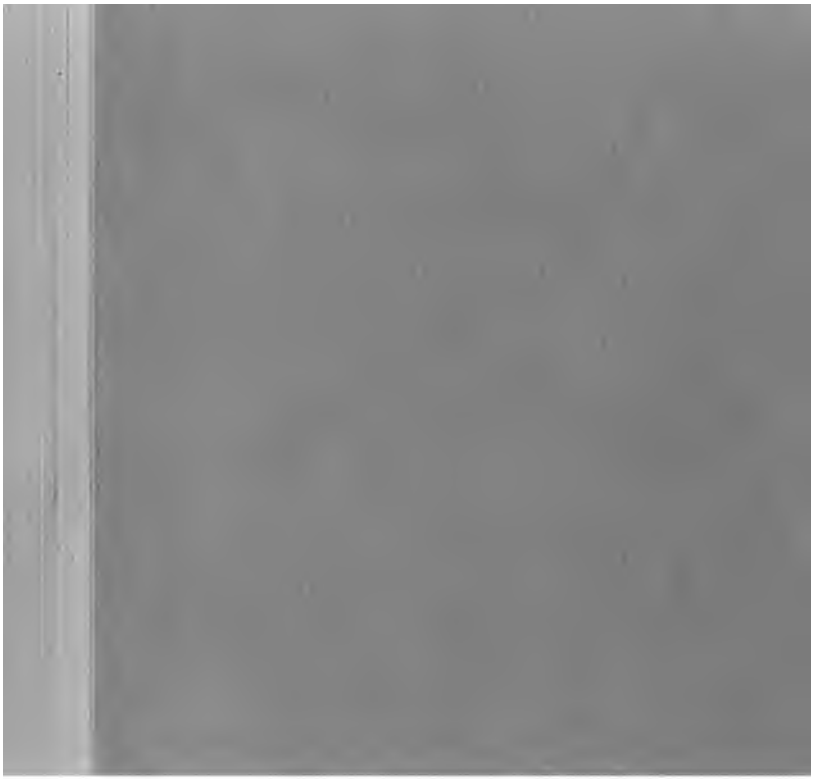
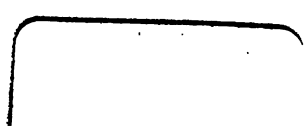
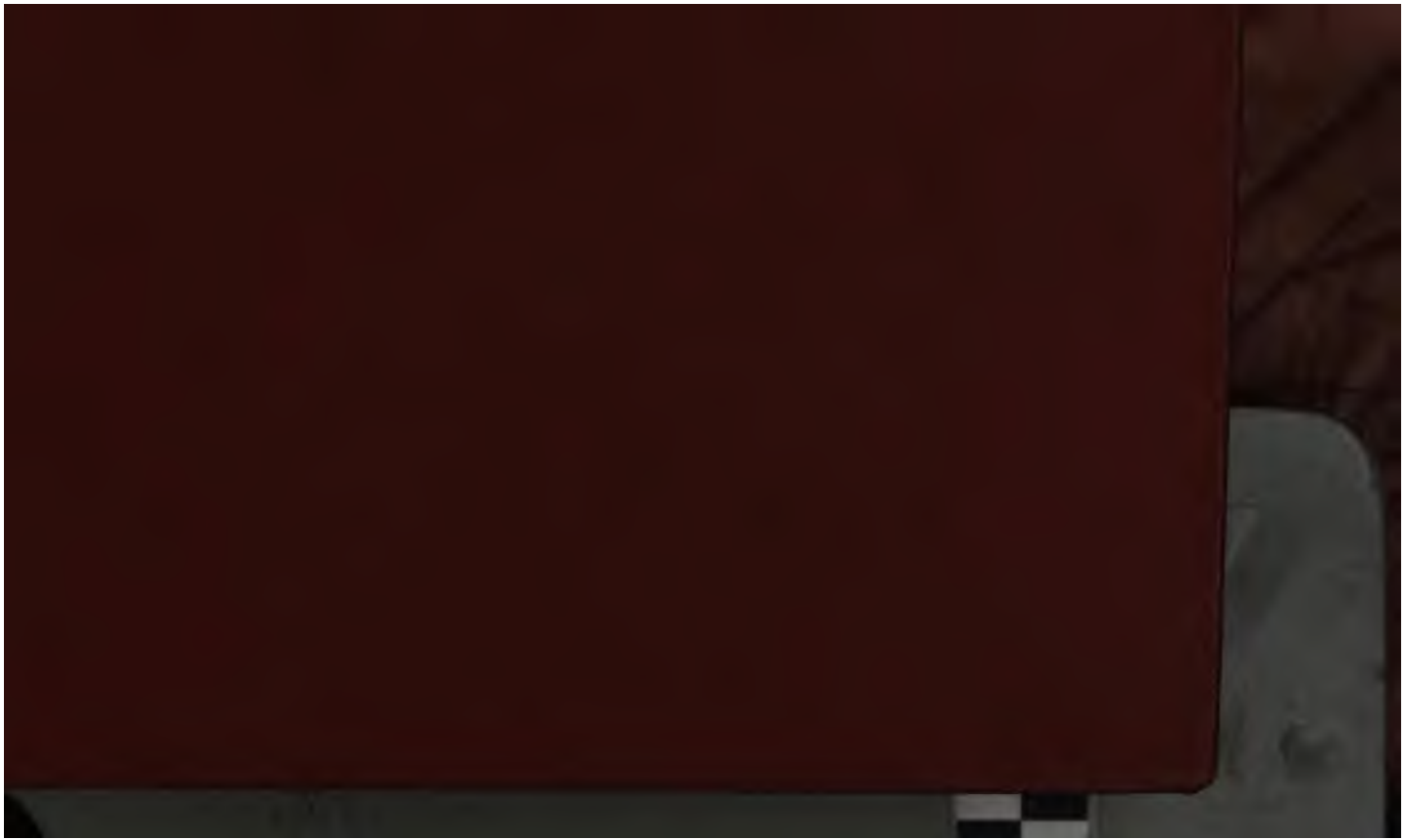
For the sake of clearness and order, some introductions to the inquiries are submitted by way of prefaces. Likewise, lest the inquiries should be too abrupt, transitional paragraphs and links are inserted.

For use, some reminders concerning practice are suggested.

To rouse human industry, a list of desiderata, with their approximations, is proposed.

I am well aware that sometimes the inquiries are so mixed up with one another that some of the things inquired fall under different titles. But my method shall be, as far as possible, to avoid the weariness of repetitions and the inconveniences of rejections; yet (when it is necessary) ever to hold these as nothing in comparison to clearness of explanation in an argument of such obscurity.

Such then is the rule and plan of the alphabet. May God the Maker, the Preserver, the Renewer of the universe, of his love and compassion to man protect and guide this work, both in its ascent to His glory, and in its descent to the good of man, through His only Son, God with us.

END OF VOL. IX.

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